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AUTHOR Havemen, Robert H.; Christainsen, Gregory B.
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ABSTRACT

This paper examines various aspects of public employment programs designed to reduce unemployment in Western industrialized countries. The historical context in which these programs emerged and the forms such programs might take are discussed. Public employment is considered in terms of special public service jobs, public works, and training and sheltered employment. Possible types of wage subsidy schemes are also considered. The nature of existing schemes in the United States and Europe is outlined and discussed according to the types of programs pursued. The economics of such policies are analyzed according to the effects these measures have on inflation, the overall level of employment, the distribution of employment, the balance of payments and the efficiency of resource allocation. Existing literature on the macroeconomic and distributional effects of job creation programs is reviewed and indirect evidence regarding the probable success of job creation measures is discussed. Notes on evaluation research and suggestions for future evaluation studies are presented. Overall conclusions are also presented. (Author/SB)

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PUBLIC EMPLOYMENT AND WAGE SUBSIDIES IN WESTERN EUROPE AND THE U.S.: WHAT WE'RE DOING AND WHAT WE KNOW

Robert H. Haveman
Gregory B. Christainsen

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Public Employment and Wage Subsidies in Western Europe and the U.S.: What We're Doing and What We Know

Robert H. Haveman and Gregory B. Christainsen

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ABSTRACT

This paper examines the theory and empirical work relating to programs of direct job creation in Western industrialized countries. After an introductory section which discusses the historical context in which these programs have emerged, the paper looks at the possible forms such measures might take. Public employment is considered in the guises of special public service jobs, public works, and training and sheltered employment. Possible types of wage subsidy schemes include earnings supplements, wage rate subsidies, and wage bill subsidies.

The nature of existing schemes in the U.S. and Western Europe is outlined in section 2. The discussion proceeds according to the types of programs pursued rather than on a country-by-country basis.

Following this description of actual direct job creation measures, the economics of such policies are examined. A priori, what effects would one expect such measures to have on inflation, the overall level of employment, the distribution of employment, the balance of payments, and the efficiency of resource allocation?

The empirical work on these issues is limited, but in section 4, the existing literature on the macroeconomic and distributional effects of direct job creation programs is surveyed. Empirical work that conveys indirect evidence regarding the probable success of job creation measures is also discussed. Here research on such issues as displacement and wage adjustment over time is considered.

In section 5, notes on evaluation research and suggestions for future evaluation studies are presented. In the final section, some overall conclusions are presented.

Public Employment and Wage Subsidies in Western Europe
and the U.S.: What We're Doing and What We Know

During the decade of the 1960s, the successful management of the economy via fiscal and monetary measures seemed assured. With the publication of A.W. Phillips' article in 1958, the monetary sector of the economy was connected to the real sector and the Keynesian system became complete. The rate of change of money wages appeared reliably related to the unemployment rate. From this Phillips curve framework emerged a consensus that policies of aggregate demand management could move an economy to an inflation-unemployment combination that somehow balanced social objectives regarding these variables.

By the end of the decade this analysis began to be challenged. Implicitly, the Phillips curve analysis assumed that the demand and supply of labor were functionally related to the nominal wage rate, while neo-classical economic theory has viewed them as related to the real wage rate. If the traditional view was correct, the Phillips curve analysis would fail to provide an adequate explanation for the empirical relationship. While the unemployment rate might act as a constraint on the rate of increase of real wages, it need not so constrain money wages.

In challenging the Phillips' analysis, Friedman (1968) and Phelps (1967) hypothesized that, when all price level effects were fully anticipated, the rate of change of money wages and the unemployment rate were, in fact, independent of one another. Ultimately, they argued, the unemployment rate is determined by the real factors operating in the labor market. Fiscal and monetary policy might still be important for affecting the unemployment

rate when price level changes are unexpected, but the economy will eventually settle at some "natural rate" of unemployment.

The "natural rate" hypothesis is not without controversy; while early tests failed to verify it, recent econometric tests have been more equivocal. In any case, most economists now contemplate both a long- and short-run Phillips curve, with the long-run curve more steeply sloped than the short-run curve. Furthermore, the 1970s have shown the short-run relationship to be an unstable one. The implication, then, is that fiscal and monetary policies are no longer viewed as the reliable instruments that they once were.

As a consequence, governments have sought alternatives to traditional demand management programs. As suggested by the natural rate hypothesis, these alternatives must focus on the structure of the labor market if they are to be successful. One such set of proposals concerns the relaxation of minimum-wage legislation and the reduction in the generosity of unemployment compensation. Another approach involves the extension of mobility-promoting measures.

In this paper we shall consider yet another strategy--the extension of direct job creation programs (public employment and wage subsidy schemes) as a means of dealing with the inflation-unemployment problem. We will consider such schemes not only as a possible means of reducing the natural rate of unemployment, but also as temporary countercyclical measures, and as a means of redistributing employment opportunities among various groups.

In section 1 we discuss the forms direct job creation programs might take. Public employment is considered in the guises of special public service jobs, public works, and training and sheltered employment. Possible types of wage subsidy schemes include earnings supplements, wage rate subsidies, and wage bill subsidies.

The nature of existing schemes in the U.S. and Western Europe is outlined in section 2. The discussion proceeds according to the types of programs pursued rather than on a country-by-country basis.

Following this description of actual direct job creation measures, we examine the economics of such policies. A priori, what effects would one expect such measures to have on inflation, the overall level of employment, the distribution of employment, the balance of payments, and the efficiency of resource allocation?

The empirical work on these issues is limited, but in section 4, we survey the existing literature on the macroeconomic and distributional effects of direct job creation programs. We also discuss empirical work that conveys indirect evidence regarding the probable success of job creation measures.

In section 5, we present notes on evaluation research and suggestions for future evaluation studies. In the final section, our overall conclusions are presented.

1. DIRECT JOB CREATION THROUGH PUBLIC EMPLOYMENT AND WAGE SUBSIDIES: THE RANGE OF OPTIONS

Of the many public policy measures designed to create employment, public employment programs and employment or wage subsidies are increasingly looked to for reducing unemployment without accelerating inflation rates. Of these two types of policies, employment or wage subsidies are generally inducements for increases in private sector employment; direct public employment programs increase the demand for public workers. Analytically, they are similar--public

employment programs are, in effect, 100 percent wage subsidy programs targetted on public activities. In this section the wide variety of direct job creation measures of these types will be briefly outlined.

Public Service Employment

Two reasons are often cited for preferring the direct stimulation of public rather than private sector employment. First, and most basically, this preference rests on the judgment that the output per worker in a public sector activity is intrinsically more valuable than the output of conventional goods and services yielded by a private sector employee. It reflects the presumption that the public sector is "starved" relative to the private sector. The second reason rests on administrative considerations. It is argued that public sector program managers can more effectively develop programs to insure that targetted goals are met and to create training and working arrangments that best meet the needs of low-skill or disadvantaged workers. It has also been argued that public programs are more flexible, more amenable to expansion and contraction, and capable of being implemented with a smaller time lag than policies designed to achieve changes in private sector behavior.

Within the category of public service employment a wide variety of options exist.

Public service employment (PSE). This form of direct job creation involves government recruitment of program participants to produce goods or services that, in general, would not be produced by either the private or public sectors. Health, child care, and environmental improvement

activities are examples often cited. While PSE programs may be motivated by the desire to alleviate unemployment, it is generally recognized that they must also produce output that is of social value if efficiency goals are to be met.

PSE programs can be either general in nature, or they can be targetted on particular groups of workers. And, if a PSE program is designed to produce employment for specified types of workers, it can do so by specifying eligibility requirements for participation (e.g., by age, sex, race, education, unemployment status) or by being applicable in only certain regions of the country.

PSE programs can be permanent in nature or they can be designed to expand in periods of high unemployment. In general, the more countercyclical the program, the greater the difficulty in yielding output of high social value.

A final distinction among such programs concerns the governmental unit that is responsible for their implementation. The federal government could design and manage such programs, perhaps securing more effective targetting. Alternatively, the design and implementation of programs could be assigned to lower levels of government (e.g., municipalities) or even private enterprises, with financing and administrative and eligibility guidelines provided by the central government unit. Such arrangements would place administrative responsibility at a level more familiar with local employment problems and decentralize the administrative burden.

Public works. A more traditional public sector job creation program involves the expansion of public works projects. Focussing on construction and building activities is likely to produce different multiplier effects that PSE programs and a quite different composition of employment demands.

Generally, the mix of workers required by public works projects favor high-skilled workers to a greater extent than PSE. Publicly supported construction activities are generally viewed as triggering general output expansion in a wide variety of supplying industries. Such programs also experience implementation lags often judged to be longer than other forms of public job creation.

Public works programs may be general or selective (targetted) in nature. Traditionally, public works have been employed as a component of regional development policies, one form of targetting. Apart from their possible effect in stimulating labor demands in various depressed geographic areas, such programs can, to a limited extent, be designed to have an impact on various skill levels of employment. Such targetting, however, may be accompnaied by a loss in productivity,[1] a result affecting PSE programs as well as public works.

Training and sheltered employment. Two final forms of direct employment creation consist of measures for human capital accumulation (education and training) and "sheltered" workshop programs for groups designated as handicapped or occupationally disadvantaged. In such programs private firms or public agencies can provide the education or training activities, with public funds financing both education and training costs and worker salaries. Public "employment" through education and training programs may not only serve to provide participants with human capital, but can be viewed as a means for reducing the measured unemployment rate. To the extent that participants in these programs escape the loss of self-esteem that often accompanies actual unemployment, the resulting gain in welfare is a benefit of the program.

Sheltered workshops can be used to provide employment for disabled or handicapped workers or for other disadvantaged groups. Public subsidization serves to ensure employment, even though workers in sheltered employment are likely to be less productive than workers employed in similar activities in the regular public or private sectors. Such activities are distinguished from PSE programs by the permanency of the employment relationship (and the firm itself) and by efforts to adapt the workplace to the abilities and needs of workers.

Wage Subsidies

For reasons of efficiency or to minimize budgetary costs per job created, intervention in the private sector may be preferred to public sector measures. As is the case with public employment programs, wage subsidies can take many forms.

Earnings supplements and wage rate subsidies. A pair of often discussed policy measures to subsidize wages are earnings supplements and wage rate subisdies. The primary attribute of both policies is that the subsidy is paid directly to workers with no necessary involvement of employers.

By their nature earnings supplements and wage rate subsidies are targetted on low earnings or low wage workers. Hence, such policies serve an income maintenance as well as an employment objective. The employment impact of such policies results from an induced increase in labor supply. In the case of earnings supplements the subsidy paid depends upon a worker's annual (or monthly) earned income and is stated as some proportion of earned income. Typically, the proportion is constant up to some earnings level, at which

point the subsidy paid is at a maximum. Beyond that earnings level, the subsidy declines so as to achieve a breakeven earnings level beyond which no subsidy is received.[2] An average wage rate subsidy is typically stated as some proportion of the difference between a worker's actual wage rate and some target wage rate. If the proportion were .5, the worker's actual wage rate $2 per hour, and the target wage rate $5 per hour, the worker would receive a public subsidy of $1.50 per hour.[3]

Under certain labor market circumstances both of these policies could lead to an increase in employment of the subsidized workers or an increase in total employment. These circumstances include flexible wage rates in low wage labor markets, positively sloped labor supply functions, and demand functions for low wage (earnings) labor with nontrivial elasticities. The mechanism is as follows: By subsidizing wages or earnings, increases in the supply of low wage labor are induced, which increases cause reductions in market wage rates in low wage labor markets, inducing an increase in the quantity of labor demanded and employed. In the long run the reduced market wage induces the substitution of low skill labor for higher skill labor and, perhaps, for capital. The employment generating mechanism operates through the labor market, and hence requires wage rate flexibility.[4]

Wage bill or employment subsidies. The most common form of wage subsidy is a wage bill subsidy. Such subsidies are paid to employers and are based on some aspect of their wage bill. The most general form of wage bill subsidy is a payment to employers which is some percentage of the magnitude of their total wage bill. Such a subsidy alters the terms of exchange between labor and capital and, it is presumed,

will induce more employment than in its absence. Such a subsidy would have an employment impact identical to that of a reduction in payroll taxes. An alternative form of such a subsidy is the payment of a flat fee per worker employed. Because such a constant dollar subsidy forms a higher proportion of the wage bill of a low wage worker than of a high wage worker, it would tend to alter the composition of employment toward low wage-low skill workers, in addition to increasing total employment.

These general forms of wage bill subsidies provide business subsidization as well as inducing increased employment. This is so because the subsidy is paid on both workers who would have been employed in the absence of the subsidy and newly employed workers. In the short run, this former component is a "windfall" to employers, contributing directly to net profits. In the long run, prices will be lower and wages higher if product and labor markets are competitive.

To remedy this, marginal employment subsidies have been suggested. In this variant, a subsidy is paid only on increments to the employment level in a firm. Such marginal subsidies are likely to induce more employment <u>per dollar of subsidy</u> than arrangements which subsidize all wages or total employment.

Subsidization could be paid on the wages paid to new workers hired, as opposed to the wage cost for an increment to total employment. Such a subsidy is referred to as a "recruitment subsidy." A potentially serious side effect of such subsidy arrangements is known as the "churning effect." Employers can increase the total subsidy received by increasing labor turnover

within the firm and collecting the subsidy on each new worker hired. Wage subsidies paid only on increments to total employment avoid this problem. These subsidies--referred to as marginal stock subsidies--provide support for an increase in the stock of employment rather than for an increase in the flow of workers passing through the firm.

Wage bill subsidies can, themselves, take several different forms irrespective of whether they are marginal or general or of the stock or recruitment varieties. They can be administered through the tax system as credits or they can be directly administered. Specific firms can be eligible for the subsidy (e.g., firms in specified development regions or industries) with the remainder excluded. Further, such subsidies can be paid on the employment of specific firms or workers (e.g., youths, females, disabled, or the long-term unemployed). The objective of plans designed to target on specific firms or workers is to alter the composition as well as the level of employment. Such subsidies are referred to as selective or targetted employment subsidies.

Wage bill subsidy arrangements are relatively flexible policy instruments and, in principle at least, the volume of the subsidy can be altered depending on macroeconomic conditions. Administrative problems are not trivial, however, with the definition and specification of a marginal or incremental worker being among the more troublesome. In general, selective employment subsidies are substantially more difficult to design and administer than general employment subsidies.

2. THE NATURE OF WAGE SUBSIDY AND PUBLIC EMPLOYMENT PROGRAMS IN THE U.S. AND WESTERN EUROPE[5]

As the previous section has indicated, both direct public employment programs and wage subsidy schemes can be structured in a variety of ways. As the unemployment problem has become severe in both Western Europe and the U.S. in the mid-1970s, governments have implemented numerous variants of both types of policy. The primary objective of these policies is to increase aggregate employment, in the process reducing unemployment stemming from both macroeconomic and structural sources. This section will describe briefly the nature and extent of these programs in a few relevant countries. The various forms of both types of programs will be distinguished.[6]

Wage Subsidy Arrangements

Wage subsidy programs have been defined as those in which the government pays some portion of either the hourly wage rate, or some portion of the wage income (accounted on a weekly, monthly, or annual basis) of workers. The subsidy can be paid to the employing firms or to workers directly, and it can apply to all employees, newly hired employees, employees above some base level, or particular categories of employees (older workers, long-term unemployed workers, or youths). As defined, wage subsidies do not include operating or investment grants to firms in financial difficulty or in regional development areas, even though such subsidies are also likely to increase employment.

Earnings subsidies. The largest and most comprehensive functioning subsidy scheme related to wages or earnings was introduced in the U.S. in 1974. It is known as the Earned Income Tax Credit and was introduced to encourage work effort by low wage-low earnings individuals. It was also designed to

offset the burden of U.S. payroll taxes supporting the Social Security system for these low wage workers. Because it is targetted on low earnings individuals and is refundable, it has been viewed primarily as a part of the nation's income maintenance system, and not as an antirecession, employment generating measure.

The program grants a 10 percent refundable credit against the first $4000 of earned income, resulting in a subsidy of $400 to a family head with children earning $4000 in a year. This benefit level is then phased out at a 10 percent rate on earned income above $4000, so that a worker earning $8000 receives no subsidy from the program. This subsidy, it should be noted, is paid directly to the individual earner, and any particular employer has no firm knowledge of whether or not any employee is a recipient of the subsidy. The Carter administration has proposed a substantial increase in the subsidy, which would both increase its benefits to low earnings individuals and extend the benefits well into the middle income range, and in late 1978, the Congress passed such an extension. In the new program, the subsidy rate is 10 percent up to $5000 of earned income for a maximum credit of $500. This maximum credit would exist until $6000 of earned income, and would then be phased out at a 10 percent rate, for a breakeven earnings level of $11,000.

Marginal wage subsidies. Because of their focus on labor supply rather than demand, earnings subsidies such as the Earned Income Tax Credit may not effectively generate increased employment. The mechanism through which the policy would induce employment increases is a reduction in prevailing market wage rates due to the increased labor supply brought forth by the policy. And in an economy in which wage rates are sticky (especially downward because of, say, minimum wages), little short-run employment is likely to be generated.

If wages are sticky, as many observers in industrialized western countries seem to believe, a wage subsidy granted to employers is likely to be a more effective generator of additional employment than one disbursed directly to workers. Such a subsidy was enacted in the U.S. in 1977--The New Jobs Tax Credit--and was to be effective for 2 years. The provisions of this wage subsidy of the marginal stock variety are straightforward:[7] First, a firm must establish eligibility for the subsidy. To do so the firm must show an increase of 5 percent in its wage bill from the previous year and an increase of 2 percent in its federal unemployment insurance tax base. This latter provision insures that only additional jobs in excess of 102 percent of the previous years' employment will be subsidized. Second, if eligible, the firm can subtract 50 percent of the first $4200 of wage income paid to any additional worker from its corporate income tax liability, up to a total of $100,000 of tax credit. It should be noted that even if this wage subsidy were a permanent part of the tax law, it would be temporary as it applies to any particular employee. Because the employment base on which the additional employment eligible for the subsidy is updated each year, employment increases in any year beyond the years' threshold are subsidized for only one year. For subsequent years, only employment beyond the threshold for those years are subsidized.

In 1977 the cost of this program, measured in terms of federal tax revenue foregone, is estimated to be $1.5-$2.0 billion. The characteristics of this plan which are of particular note are (1) it is a subsidy paid to employers on incremental employment, measured as employment additional to some threshold level of employment, (2) the subsidy applies to all incremental

employees, irrespective of their prior employment status or their occupation, religion, or age, (3) the subsidy rate is fairly high, and especially significant for low wage workers, and (4) the total subsidy payment to individual firms is capped.

The imminent lapse of the New Jobs Tax Credit has prompted a number of alternative proposals. The Carter administration has proposed replacing the New Jobs program with a Targetted Employment Tax Credit that would subsidize firms for 33 percent of the first $6,000 of wages for the first year of employment paid to all low income workers who are 18-24 years old or handicapped and 25 percent for the second. The version of this proposal which was enacted in late 1978 limited the subsidy to newly hired target group members, extended the group to include various categories of welfare recipients, and increased the subsidy rate for the first year of employment to 50 percent. It was to be a two-year program.

Temporary wage subsidies. Experimentaion with temporary wage subsidy schemes has been widespread in Western Europe in the mid-1970s. The temporary nature of these programs was emphasized to encourage rapid response on the part of employers. For example, in Germany, a 6-month expansionary wage subsidy program was put into effect at the end of 1974. (This program is known as [ABM] Allgemeine Massnahmen zur Arbeitsbeschaffung.)[8] For the duration of this scheme, the government paid 60 percent of the wage costs of additional hirings of registered unemployed workers with more than 12 weeks of joblessness in designated high unemployment regions (those with rates in excess of .5 above the national rate) for a period of 6 months. As such the subsidy was a recruitment subsidy rather than a marginal stock subsidy. The hiring decision could be made at any point during the 6-month

duration of the scheme. Employers were required to certify that the employment provided is permanent, would not have occurred in the absence of the program, and that a net increase in employment above the base stipulated occurred. An interesting characteristic of the plan is that the base level of employment was set at that of a date prior to enactment of the legislation. As would be expected, administrative difficulties with the definition of "permanent," "additional," and "unemployed" were experienced. During the brief period in which the law was in effect, the employment of over 80,000 workers was subsidized, at an average cost of about $2000 per job. One-half of the expenditures were in construction and in manufacturing.

The ABM scheme was accompanied by a related plan, which, although not a wage subsidy, also has the effect of reducing the market wage rate. This scheme involved the payment of a subsidy to workers who had been unemployed for at least 3 months (again in a high unemployment area) if they took a new job in either (a) a different region, or (b) at a wage rate at least 10 percent lower than the previous job, or (c) in a situation requiring training or new job requirements. The subsidy paid was rather small--about $200 for a married worker--and was taken up by about 25,000 workers. It too expired after 6 months.

Also for purposes of expansion, France introduced a wage subsidy (called an Incentive Bonus for Job Creation) in 1975, designed to last for 6 months (June-November 1975). In fact, the scheme was prolonged until the end of 1977, but restricted to craftsmen and small businesses. Under this plan, the government paid private sector employers about $30 per week for 26 weeks for each additional worker hired under a regular contract or minimum employment

of 1 year, if that worker was registered for employment for more than 6 months, a first-time job seeker, or a youth, and if the job was created during a specified period of time. Hence, this plan is also a recruitment subsidy. In applying for the bonus, employers must certify that the employment was given and that other terms were met. Provision was made for up to 100,000 new jobs. By the end of 1975, subsidies were paid to 38,000 workers; by March 1977, this had increased to 89,000 workers. Legislation introduced in 1977 increased the wage subsidy rate to 25 percent (via elimination of payroll taxes) and expanded coverage to all employers.

A related recruitment subsidy program (the Employment and Training Contracts System) was also introduced in France in mid-1975. In this program, employers would contract with the state to offer employment (lasting at least 6 months) and training to youths. The wage subsidy paid is equal to 30 percent of the minimum wage for the first 6 months of the contract, and is increased to 100 percent of the minimum wage for the 1-2 months of training offered. The government also reimburses the costs of the training program at a rate of $1.50 per hour per trainee. Like the Incentive Bonus scheme, this plan was designed to be temporary, but was prolonged indefinitely. The plan was also expanded in 1976 to permit training programs of up to 6 months duration. By March 1977, 27,000 youths were provided employment-training through the program. Most of the training was given in-plant and was undertaken primarily by the larger firms.

In July 1977, the French government implemented a further measure--a general wage subsidy--designed to stimulate employment opportunities for youth. Any employer who hires a person under 25 years of age receives an exemption from social security contributions which would otherwise have to be made. By the end of 1977 close to 340,000 youths had been covered by the program. The

tax credit is not a marginal one, and there has been concern that subsidies are being paid for workers who would have been employed in any case. There also has been some displacement of older workers as a result of the program.

Another extensive temporary wage subsidy scheme (the 30 Percent Wage Bonus Plan) was introduced in the Netherlands from 1973 through 1975. To a greater degree than the programs in France and Germany, the Dutch program was targetted on specific groups--those registered as unemployed for more than 6 months and workers older than 45 years of age. For additional workers 45 years old or less who are hired, firms receive a subsidy equal to 30 percent of the wage bill (including Social Security contributions) for 6 months. For older workers, the 30 percent subsidy is paid for a full year, irrespective of whether these workers were long-term unemployed or not. For the young workers a cap of $2200 was placed on the total subsidy award; a cap of $4400 was instituted for the older workers.

Sweden also has in place extensive possibilities for providing wage subsidization to firms in periods of low labor demands. By and large, Swedish labor market policy has sought to tie the wage subsidy to employer provision of training opportunities in lieu of lay-offs of already employed workers. The plan, therefore, is of a marginal recruitment variety, except that the objective is to forestall layoffs rather than to encourage hirings. Prior to 1977, the per hour subsidy ranged from 22-33 percent of the worker's gross wage, up to 6 months of employment. After 1977, the grant was increased to 65 percent of the gross wage for the first month and to about 40 percent of the gross wage for the remaining 5 months. During 1976, the size of the program averaged about 4000 workers and about 13,000 people received training in the year. Since the expansion of the grant, the program has averaged from 40-50,000 workers per month, over 1 percent of Sweden's labor force. Because some of

the supported workers were part time or part year, this number is equivalent to about 16,000 full-time workers. The size of the program in 1977 is 10 times as large as in 1976. Over 90 percent of the subsidized workers are in manufacturing.

In 1976 a special wage subsidy scheme was introduced to provide subsidization for youths under 20 years of age. The subsidization rate was about 25 percent of gross wage costs for 6 months, and was paid on additional youths hired for at least 3 months. While initially viewed as a temporary program it has been extended beyond 1977, and provides support to about 4000 youths per month, about 30 percent of the unemployed individuals in this age range.

A major employment subsidy scheme for handicapped workers is also in place. In this program firms can claim a subsidy for up to 40 percent of the gross wages of handicapped workers. In 1975, about 8,000 workers were being subsidized through this program; in 1977 the figure rose to 15,000.

In 1977 two bills were passed providing temporary wage subsidies for elderly workers in the textile and clothing industries (40 percent of gross wages for workers 50 years of age or more) and for specialized workers in the iron, steel, and engineering industries (75 percent of wage costs available to firms facing serious cutbacks). It is estimated that from 30-35,000 workers will be covered by this subsidy arrangement.

Finally, in 1978, the Swedes introduced yet another program, a temporary marginal employment subsidy designed to stimulate a general increase in employment. The program originated in response to an expected decrease in industrial employment during the latter part of 1978 and was designed to expire on July 1, 1979. Any establishment which has experienced a net

increase in employment on July 1, 1979 beyond its May 1, 1978 level is eligible for the subsidy. For every new employee recruited in the period from July to September 1978 the employer receives about $2500. New employees recruited from October to December 1978 result in subsidies of about $1650. Those recruited from January to March 1979 result in payments of close to $850. Employers are required to satisfy the union involved that the relevant employees receive a minimum of training (about 2-month's worth), with the amount of the subsidy being set to cover the additional costs incurred.

In 1975 Ireland began awarding (through the Premium Employment Program) an annual subsidy which averaged about 25 percent of the wage cost of each additional job in Dublin County and 50 percent of the wage costs in other specially designated areas, up to a maximum of $6000 in Dublin County and $8000 in the special regions. The additional jobs had to be filled by workers who had been unemployed more than 4 weeks, or in a training center, or in short-time work, or in prison prior to the scheme. In both of these cases, the subsidy is on the wage bill, is paid to employers, is designated for particular regions, and is targetted on incremental employment above employment on a stipulated base date. The program was to have lasted one year but was ultimately extended to March 1977. In 1976 about 7000 workers were being subsidized--above 3 percent of the workers in the relevant industries, one-third of whom were female and nearly one-half of whom were transfers from short-time work.

All of the above wage subsidy schemes have focussed on expanding employment above some base level. With the exception of one of the Swedish plans, and the French youth subsidy they were of either a recruitment or marginal stock variety. In August 1975 the United Kingdom introduced a 1-year

(extended to 18 months) wage subsidy program (Temporary Employment Subsidy) which was also marginal, but similar to the basic Swedish scheme. Its purpose was to forestall planned lay-offs. Any (long-run viable) firm which can certify a planned lay-off of 10 or more workers is eligible for a subsidy equal to about $40 per week on the to-be-laid-off workers for 3 months with extensions making subsidizations possible up to one year.[9] In January 1977 about 270,000 jobs were subsidized at a total budget cost of about $.5 billion. Up to 2 percent of employees were covered in some of the high unemployment regions, and up to 14 percent of the workers in some industries (e.g., clothing).

Regionally based wage subsidies. All European countries have regional development policies, and in many cases wage subsidies, typically paid to employers, have been a part of these policies. Because of the sectoral (regional) focus of these schemes, the reduction of structural unemployment has been the basic objective.[10]

Sweden provides an example of such a regionally based wage subsidy arrangement. Development (declining or high unemployment) areas have been designated, and employers located in such areas (which contain about 5 percent of Sweden's population and employers hiring about 20,000 workers) can receive a government subsidy equal to 11 percent of the first 2 years of wage costs (and somewhat less for the third year) incurred for any additional worker employed. As with all marginal subsidy schemes, the determination of incremental employment has presented difficulties. In this plan, the employment or unemployment status of the worker at the time he/she is hired is apparently not an issue. In each year, about 1500-2000 jobs are covered by the subsidy.[11]

A similar program was introduced by the Netherlands in the mid-1970s. In that program, a subsidy payment of nearly $1500 per year is granted to firms' in specified regions for each additional employee hired.

Until it was eliminated at the end of 1977, the United Kingdom has had a long-standing wage subsidy plan for development regions, entitled the Regional Employment Premium (REP). Unlike the incremental regional subsidies just described, this plan provided a per worker subsidy to employers in manufacturing in the designated regions. In 1974 the premium was doubled and in 1975 amounted to about $300 per worker (between 5-7 percent of wage costs). Over 1.5 million workers (about 6 percent of British employment) were covered in 17,500 firms with a total budget cost of nearly $.5 billion. Because this program provided subsidization to all employees, it was much less effective in inducing employment than if expenditures were targetted on incremental employment. It did, however, lead to some reduction in the price of labor relative to capital. Because of its regional character, it was sometimes referred to as "regional currency devaluation."

The U.K. filled the vacuum created by the demise of the Regional Employment Premium with the Small Firms Employment Subsidy. Introduced in July 1977, the subsidy was limited not only to firms in "special development areas," but also to manufacturing establishments of under 50 workers.

Eligible establishments receive close to $40 a week for net increments to employment beyond that existing March 29, 1977, the day the subsidy was announced. Hence, the program is a marginal stock subsidy. The subsidy is paid for a maximum of 26 weeks.

Under the scheme the number of workers subsidized grew steadily; 4,250 workers were covered in December 1977. While the subsidy was designated as

experimental, having been set to expire on March 31, 1978, it is being replaced by a similar scheme after its evaluation has been completed. The new scheme will be open to firms of up to 200 workers and will operate in a much wider area of the country, the so-called "assisted areas." The program is expected to cover 75,000 workers.

Public Employment Programs

Wage subsidy programs seek to induce private sector employers to increase labor use by reducing the cost of labor relative to capital inputs. An alternative strategy is to provide direct employment in the public sector. In the 1970s, this strategy has also been pursued in the U.S. and Western Europe.

Expanding employment in regular agencies. One antirecessionary public employment strategy is to accelerate expansion of employment in regular public agencies. An example of this approach is included in the Comprchensive Employment and Training Act (CETA) in the U.S. As part of this legislation, federal government grants are made to state and local governments to support hiring which would not otherwise be undertaken. By reducing the costs of incremental employment to state and local agencies (in some cases to zero) and by enforcing regulations designed to constrain sub-federal agencies from diverting funds to new hires, which would have occurred in the absence of the program, the program seeks to mandate increased public sector employment as an antirecession strategy.

The CETA program in the U.S. has assumed major proportions in recent years. And, as it has developed, emphasis has shifted from increasing employment generally to increasing the employment of specific groups, e.g., low-skill, poor workers, long-term unemployed, and youths. Because the

size of the program (in terms of slots and funding) is regularly reappraised by the administration and Congress, it is a temporary and flexible policy instrument.

Western European countries have also adopted such direct public employment programs, though on a limited scale. In Ireland, for example, a program of direct employment in amenity, cultural, and environmental activities was initiated in the 1970s. Priority is given to unskilled, long-term unemployed workers, and the budgetary costs of this program are approximately $10 million annually.

The U.K.'s Job Creation Programme has borne a close resemblance to the Irish scheme. Beginning in October 1975, sponsors (usually local authorities) with approved, short-term projects can be reimbursed for their wage costs plus 10 percent toward running costs. Those employed must be taken off the unemployment register with priority given to those under 25 or over 50. About 109,500 jobs had been created by October 1977 with about 43,000 jobs being provided at that time. In 1976 about one-third of the projects involved were for environmental improvement, a third were educational or service-oriented, and a sixth were construction projects. The rest were mainly research and survey work. The average number of workers per project was around 10. The scheme was scheduled to expire at the end of 1978 and to be superseded by other employment programs.

The most important of these is the Youth Opportunities Program. This scheme will also supersede the recent experimentation with youth wage subsidy programs. All schemes for youth under 19 are now to be coordinated within this new program. While projects along the lines of the Job Creation Programme will be incorporated, the emphasis is on enabling

young people to acquire training and work experience. Places are provided for about 130,000 individuals at any one time and participants receive about $35 a week.

In 1975 the Netherlands also inaugurated a similar direct public employment program. Again, structural concerns dominated as the Temporary Jobs Scheme was focussed on workers who were unemployed for 6 months or more. For long-term unemployed workers less than 45 years, 26 weeks of employment in a government agency is granted at the pay scales of regular government employees. Up to 1 year of agency employment is granted to workers older than 45 years, irrespective of the duration of their unemployment. The program began slowly with about 4000 persons given positions in the first year of operation. A follow-up study early in the life of the program indicated that about one-third of the workers were placed with a regular employer upon termination of their public employment.

Similar temporary direct public employment programs have been employed in Sweden, Germany, and France, though in all of these countries the size of the programs has been modest.

Public works. A second form of direct public job creation is the new or accelerated public works projects. This strategy has traditionally played a role in antirecession policy and is based on the view that growth in construction and building acitivities will lead to growth in other activities through both multiplier and intermediate good demands.

Apparently, public job creation through public works has not been an important element in either U.S. or European antirecession policy in the 1970s. However, even though no large spurt of job creation activity

occurred in the mid-1970s, a number of new (or emergency) public works can be identified in Belgium, Denmark, Germany, and the Netherlands. The most well-developed emergency public works policy belongs to Sweden, which maintains a shelf of public works awaiting invitation in response to employment variations. In 1974 about 24,000 people per month were provided work under this program with provision for doubling of the size of the program in 1976 should the employment situation warrant it.[12]

A number of reasons have been offered to explain the relatively modest use of this traditional instrument, including the inherent lags in the implementation of such programs, the price sensitivity of goods demanded by the construction industry, the opposition to traditional public works by environmental groups, and the relatively prosperous status of the building trades relative to these sectors. A more likely explanation of this pattern is to be found in the magnitude of the budgetary costs of public works spending relative to, say, wage subsidies. A wage subsidy strategy--particularly a marginal wage subsidy--carries substantially more job creation leverage per dollar of budgetary cost than does direct public employment. And in a period of concern with the inflationary effect of public deficits, a shift from public works to wage subsidies would be expected.

A final explanation for the relative absence of emergency public works activities relates to the widespread concern in Europe with the relative size and condition of the private and public sectors. The recession of the 1970s saw major segments of European industry in serious financial difficulty and claiming a loss of international competitive position, e.g., ship building and clothing in the Netherlands, automobilies in France, and a wide range of heavy industry in the United Kingdom. In response to this condition governments

have made extensive financial assistance available to private industry in a wide variety of forms--cash grants, low interest loans, tax concessions, temporary takeovers, and government equity participation. As anti-recession, job-creating (or job-preserving) activities, these subsidies have partially replaced the more traditional public works activities. They, in effect, represent job creation by the public sector through the conduit of private industry.

Training programs and sheltered employment. In many European countries--Sweden being a prime example--active manpower policy has focussed on the provision of training as an alternative to unemployment in a period of recession. The mid-1970s were no exception. Large increases in such training programs, often in-plant and subsidized by the government, were observed in Sweden and Germany. In Sweden, the number of workers involved in such training programs was nearly 60,000 in 1977. This program pays an allowance equal to slightly more than unemployment benefits (75-85 percent of net wages) to workers whose jobs are threatened by low demand (or who are willing to move to "shortage" occupations) and who are willing to participate in a labor training program. There is apparently no restriction on the period of training, though the average is about 6 months. The number of people in this program has ranged from 45,000 to 60,000 in recent years (1.0-1.5 percent of the labor force). In 1977, about .7 percent of GNP was spent on this program.

Another variant of this disguised form of public employment is the expansion of traditional sheltered workshop programs, often designed for disabled or handicapped people. In some of the European countries, these

programs, which are largely supported by public subsidies, have been expanded rapidly during the recession of the 1970s. Standards for admission have been relaxed and, especially for older workers or those with some physical or vocational disadvantage, employment in such programs has been viewed as an alternative to unemployment or withdrawal from the labor market. For example, the Social Employment program in the Netherlands experienced a growth in the number of municipally operated, government-fiannced, sheltered workshop employees from 44,000 in 1971 to 70,000 in 1977. Because of weak markets for the sale of the output of these enterprises, the need for government subsidization has increased in the 1970s; the subsidy for the Netherlands Social Employment Program increased from $321 million to $835 million from 1970 to 1975. Rapid growth in such programs has also occurred in other countries, in particular, Sweden and Denmark.

3. THE ECONOMICS OF WAGE SUBSIDY AND PUBLIC EMPLOYMENT PROGRAMS

The major objective of public employment and wage subsidy programs is to stimulate employment and to reduce the level of unemployment in the economy. To many, this is the only, or at least the over-riding, objective and such policies appear attractive because of a presumption that the net job creation per dollar of public deficit increase will be larger than with alternative policies. Direct job creation policies also appear attractive because they have other relevant impacts. For example, these policy measures, to the extent that they do decrease unemployment, may do so with less accompanying inflation than other equally costly policy measures. This would be a complementary benefit. If this were to occur, the policies would, in effect,

either shift or reduce the slope of the Phillips curve. Further, these policies may well have favorable effects on the country's balance of payments at any given exchange rate, a further complementary benefit.

While the employment objective is often viewed as the central objective, there is a more comprehensive criterion by which these policies should be evaluated. It is possible that such policies might lead to reduce unemployment--indeed, reduced unemployment with beneficial inflation and balance of payments effects--and, at the same time, entail a reduction in real economic welfare. This could occur, for example, if the workers employed would, in the production process, use up other inputs (labor and materials) and yield a very low socially valued output. In this case, the program would not pass the economic efficiency criterion even it did reduce unemployment.

Even if wage subsidy and public employment programs failed to reduce unemployment or mitigate inflationary and balance-of-payments concerns at existing exchange or unemployment rates or pass an economic efficiency test, they might achieve still other desirable goals. By altering the composition of labor demands so as to favor targetted groups at the expense of others, the composition of unemployment might be changed, even if its level were not. Unemployment rates of the target groups would fall, while the unemployment rates of other groups rose. This could lead to a further impact of a compositional sort. If the target groups are low wage, low skill, or long duration unemployed workers, the altered composition of unemployment would be accompanied by a redistribution of earned income from higher to lower income units. And, depending on one's perspective, this income equalizing effect could also be a benefit.

In discussing the economics of these policy measures, then, the analysis underlying the following five questions will be discussed:

- Under what circumstances will direct job creation measures more effectively reduce unemployment than alternative programs with an equivalent budgetary impact?
- Under what circumstances will direct job creation measures improve the terms of trade between unemployment and inflation?
- Under what circumstances will direct job creation measures serve to alleviate balance of payments problems?
- What conditions must be met if direct job creation measures are to be economically efficient?
- Under what circumstances will direct job creation measures alter the composition of unemployment or the distribution of income?

Because the answer to these questions is strongly affected by the specific characteristics of the public employment or wage subsidy program, these characteristics will be specified in order to make the analysis manageable. Hence, we will focus on programs which are targetted on low skill and high unemployment workers, rather than being general in their coverage. And, in thinking about wage subsidy programs, we will concentrate on marginal stock wage subsidies, rather than general or recruitment type subsidies.
We will first summarize the analytics of the issue, and then discuss some of the primary research evidence pertaining to these questions.

The Analysis of Direct Job Creation Measures

Do direct job creation measures reduce unemployment? All wage subsidy and public employment programs share a common objective--the creation of jobs.

At first blush, the link between these policies and aggregate employment is clear--an unemployed worker placed in a special public service employment program (or hired by a private business in response to a wage subsidy) is presumed to represent one additional employed person and one less unemployed person. However, given the complexity of the economic system, this obvious linkage may not in reality exist. For example, the financing of the hiring of one more worker in a public employment program may result in less spending elsewhere in the economy resulting in the release of some other worker (or even more than one). Similarly, a wage subsidy, by reducing the relative price of labor to an enterprise, may induce an additional worker to be hired but simultaneously reduce employment by some amount elsewhere in the economy through the resulting reduction in the demand for capital or other forms of labor. Still further, the output produced by the additional worker may be competitive with and substitute for the output produced somewhere else in the economy.

All of these potentially offsetting impacts can be referred to as displacements. In each case, the effect is to create a gap between the total number of workers hired in a PSE program (or subsidized by an employment subsidy) and the net increment to employment in the economy. This gap expressed as a ratio to the gross number of workers hired or subsidized is referred to as the displacement effect. The net employment impact of the policy is the total employment in the economy with the program less the total employment without the program.

The displacement effect as we have defined it is somewhat different than at least two other concepts of displacement found in the literature on these programs. Both of these concepts are more limited in scope than in the concept

as we have defined it. To avoid confusion, these alternative concepts of displacement will be noted here. The first notion of displacement refers to the public service employment programs and concerns the ability of public sector decision-makers to substitute PSE workers for regular workers who would have been employed without the program in place. This reduction in regular public sector employment in response to the program is tabbed "displacement." The second notion refers to the disparity between the number of workers in a firm who are subsidized (in, say, a marginal wage subsidy program) and the number of workers which the firm hired because of the subsidy who would not have been hired in its absence.

Both of these concepts are partial: The first refers to the difference between gross and net effects only within the public sector, while the second refers to this difference only within the firms subsidized. The more general definition employed here concerns the displacement which occurs after the demand, supply, and relative wage and price effects have worked themselves through the economy.

Consistent with our definition of displacement, then, the net employment effect of direct job creation measures depends on the extent to which labor demand reductions are imposed on the economy simultaneously with (and as a side effect of) the direct employment demand. One polar position regarding this potential offset holds that a given increment in employment demand stimulated by a public policy measure (say, a public employment program) will displace an equivalent amount of labor demand elsewhere in the economy. This position is associated with a strict form of neo-classical economics and, for want of a better title will be referred to as the "classical" position. The opposite pole, which we will refer to as the "interventionist" position, holds

that at least in periods in which there is some unemployment no alternative labor demand is displaced by the government program. The truth, in all likelihood, lies intermediate to these two positions, and varies over economic conditions, the nature of the program, time, and types of economic institutions.

To determine the extent to which public employment and wage subsidy programs will result in a net increase in employment, both the price and employment effects of the policy must be analyzed. The relative magnitude of these effects depends on the elasticity of labor supply. At one extreme, if aggregate labor supply is perfectly elastic with respect to the price of labor--as it might be at high levels of measured unemployment--increases in the aggregate demand for labor stemming from the policies would increase employment, but have little effect on wages or prices. At the other extreme, if aggregate labor supply is perfectly inelastic with respect to the wage rate, increases in aggregate demand have no effect on employment and serve only to increase wages and prices. If, as many believe, aggregate labor supply is somewhat elastic at unemployment rates existing at present, government policies designed to directly create jobs will increase employment without significant upward pressure on wages and prices. This, of course, does not suggest that such wage and price pressures will not exist in the long run in response to these policies. This is consistent with the view of many economists that there exists a "natural rate" of unemployment which depends on a number of basic conditions in the economic system, including the structure of wages and prices, the volume of labor market information, and impediments to labor mobility.

From a macroeconomic perspective, then, an optimistic view of wage subsidy and direct public employment programs holds that they increase aggregate labor demand and employment, with little effect on prices. A pessimistic view would suggest that these program do not on balance significantly increase aggregate labor demand, and that such increases as do occur ultimately serve only to increase wages and prices rather than employment.

One approach to viewing the extent of net employment creation associated with direct job creation measures (or any other public spending measure) could be called the benefit cost perspective. In this approach, the task is to appraise the magnitude of the offsets which drive a wedge between the gross and net employment effects of direct job creation programs. These offsets include: 1) the reductions in labor demand derived from decreased spending in response to the taxes or borrowing required to finance the program, 2) the reductions in labor demand from reduced capital demands associated with the labor-capital substitution incentives implicit in both direct job creation measures, 3) the reductions in private sector output and labor demand because of product competition from the output of the activities impacted by direct job creation and 4) the "fiscal displacement" effect pertinent to direct public employment measures in which public sector employers hire individuals with direct job creation monies who would have been hired in any case (or the "windfall effect" in wage subsidies in which those workers subsidized would have been employed even if no subsidy existed).

While this discussion emphasizes the wedge between the gross and net job creation, it says nothing about how public employment and wage subsidy

programs compare to alternative macro-type policies--tax cuts or general increases in government spending--with an equivalent net deficit impact. Defining job creation potency as the change in net employment per dollar of increase in the net deficit, it is widely accepted that the increase in the public deficit created by a $X tax cut is less potent than an increase in government spending of $X. However, comparing the impact of spending for wage subsidies and direct public employment with other forms of spending is not so clear cut. Presuming that direct job creation programs are targetted on low wage, low skill workers, they are likely to be more effective employment generators than general government spending for at least three reasons: 1) These programs are apt to promote economic activity which is labor-intensive in nature, at least in the first-round; (2) the beneficiaries of these programs are apt to have a high marginal propensity to consume; and (3) if transfer programs are not considered, beneficiaries are apt to face lower marginal tax rates than the general population. Reasons (2) and (3) suggest larger expenditure multipliers for direct job creation programs than for general public spending.

While both wage subsidies and public employment measures would seem to be more potent employment-inducing measures than general public expenditures or tax cuts, a marginal wage subsidy of the stock variety is likely to be more potent than direct government job creation. Depending on the effectiveness of the targetting of the subsidy on marginal employment decisions by firms, the wage subsidy would appear to be able to stimulate jobs for less than the marginal supply price. This leverage characteristic of the marginal wage subsidy is one of its key attractions. On the other hand, the government

budget costs per job created through direct public employment are likely to be at least equal to the marginal supply price of labor. And, for nonmarginal wage subsidies, the budget cost per job created could well be in excess of the marginal supply price of labor.

This discussion concerning the effect of these programs on net job creation relative to that of alternative public expenditures fails to deal with their impact on the level of unemployment or the unemployment rate. As the U.S. experience of the last few years has made clear, it is quite possible to simultaneously experience major increases in employment with little reduction in the unemployment rate. The issue here is the responsiveness of labor force participation to implementation of the program. To the extent that nonparticipants enter the labor force because of the job creation programs, the effect on unemployment will be less than the effect on net employment. On the one hand, it is reasonable to speculate that job creation programs focussed on low-skill, low wage, high unemployment groups will induce a greater increase in labor force participation than more general public expenditures because of the attraction into the work force of similar, currently nonparticipating individuals. Such individuals form the core of the discouraged worker group. On the other hand, it could be argued that with very high unemployment rates affecting these low skill groups, relatively little increase in labor force participation will be forthcoming from an increment to labor demand focussed on low wage jobs. On this view, an equivalent increase in aggregate labor demand distributed over the wage distribution would induce a greater increase in labor force participation than a direct job creation program targetted on low skill workers.

There is another, more subtle effect of this impact. Because of the effect of targetted programs on the composition of labor demand (to be discussed below), an increase in total employment (and a reduction of unemployment) may result even if the programs generate no increase in aggregate output in the economy. If the programs are targetted on low productivity workers, and if no increase in output occurs, more low productivity workers will be given jobs than high productivity workers are displaced. The effect will be a larger increase in total net employment than policies without this compositional impact and, if labor force participation is not totally offsetting, a larger reduction in unemployment.

One final distinction between wage subsidies and public service employment should be noted with respect to their net employment effects. Potential differences between the two strategies exist in terms of flexibility or lags between policy implementation and employment generation. Because the level at which public employment programs are operated is directly determined by the government (as opposed to working indirectly through altered private sector incentives) and because they do not have to confront the charge of distorting private sector planning efforts when program size is altered, public employment programs appear to some to have both greater flexibility and smaller implementation lags. Also, the size of the policy stimulus can be more effectively controlled in the case of direct public employment than in the case of wage subsidies which tend to be open-ended. Finally, because the administration of government-operated public service employment programs can be more closely monitored than that of employment programs operated by a contractor or by private enterprises responding to a subsidy, it could be argued that direct public job creation would be

more effective than wages subsidies in achieving whatever targetting goals are established. All of this is very speculative, however, with little data to substantiate arguments on either side of the issue.

Do direct job creation measures alter the trade-off between unemployment and inflation? In addition to increasing employment, and in most circumstances, doing so with greater net job creation impact than traditional expansionary measures, direct job creation measures may also generate the increased employment with less wage and price inflation. The argument that this benefit will also accrue from targetted direct job creation efforts rests on the proposition that in those labor markets relevant to the target groups, wage rates will not rise (or not rise very much) in response to a policy-induced increment to demand. Such wage rigidity is inconsistent with the operation of competitive markets with supply elasticities less than infinity, but it may well characterize some actual labor markets.

Consider, for example, the effect of minimum wages. In the labor market for low skill workers, the minimum wage appears to peg the wage rate at a level above the market clearing wage--excess supply is the result. And, because the wage rate in such labor markets already exceeds the market clearing level, an increase in labor demand will have little or no upward impact on the wage rate. This is true, of course, unless the increased demand results in an increase in the minimum.

Other circumstances can also cause the wage rate in some labor markets to be unresponsive to increases in demand. Examples would be labor markets in which wages are set above market clearing levels by tradition, labor

markets in depressed regions in which wage levels are set by industry-wide union contracts, or the circumstance in which wage increase pressure in a particular market depends negatively upon the wage in that market relative to other wage levels, in addition to the level of excess supply. In this last circumstance, aggregate wage pressure in the economy would be reduced (even if full productivity displacement occurred) and the wage rates of target group workers would rise in response to policy measures. This would occur as the wage of target group workers relative to that of nontarget group workers is increased by the policy, inducing less job turnover and search, and, hence, less upward wage pressure by the target group workers.

The ability of direct job creation measures to achieve reduced unemployment simultaneously with reduced inflationary pressure depends upon the ability of these programs to target their incremental labor demands on sectors with low upward wage responsiveness. Because such sectors tend to be those most heavily affected by minimum wages or regionally depressed markets, direct job creation measures targetted on these sectors are more likely to generate employment with low induced inflation than more general, less targetted demand stimulation measures.

This interaction between the price level and the unemployment impacts of these policy measures has often been discussed with reference to the unemployment consistent with nonaccelerating unemployment (NAIRU). Because of market rigidities caused by legislation and institutional phenomena, it is suggested that accelerating rates of price increase will be encountered if the unemployment rate is driven below some level--NAIRU--by general demand stimulation measures. Selective direct job creation measures are viewed as

structural labor market policies designed to avoid these rigidities, and, hence, reduce NAIRU. The notion of reducing NAIRU is closely related to the idea of "cheating the Phillips curve," which is often used to describe the effect of such selective employment programs.

With respect to this objective as well, direct public employment and marginal wage subsidies are not homogeneous. As indicated above public employment may be more flexible and more directly targetable and, hence, may score more highly on this objective than wage subsidies. Off-setting this advantage however, is the fact that public employment programs with high (or even "prevailing") wages may contribute to general upward wage pressure. Past experience suggests that the wage offer in public service jobs will be in excess of the supply price of low skill labor, because of political pressures. Moreover, wage subsidies--especially those of the marginal stock variety--induce reductions in the level of the marginal cost function of firms receiving the subsidy. In a competitive environment, these reductions could be expected to lead to reduced prices. In addition, to the extent that small enterprises or those experiencing large percentage increases in employment are eligible for greater subsidization, entry will be encouraged and price competition forces strengthened.

Do direct job creation measures have beneficial balance of payments effects? Price level reductions induced by direct job creation measures (say, a marginal stock wage subsidy)[13] will, at any given exchange rate, reduce a deficit in a country's balance of payments, or, alternatively, increase a surplus. Of course, if exchange rates float freely in response to supply and demand conditions in the foreign exchange market, there will always

exist a tendency for deficits or surpluses to be eliminated. In this case, price level reductions which are not matched by trading partners will cause a country's currency to appreciate in foreign exchange markets.

But if exchange rates are publicly regulated or fixed by international agreement or if they adjust sluggishly to market conditions, price level reductions which are not matched by trading partners mean that one's exports have become relatively cheaper. Likewise, imports have become relatively more expensive.

A wage subsidy program may have a favorable influence on the balance of payments irrespective of its effect on the domestic price level. Presumably, only domestic firms are eligible for subsidies, giving those which engage in external trade the ability to further penetrate foreign markets. Even if a wage subsidy does not reduce the domestic price of output, the reduction in marginal costs it produces is likely to induce firms engaged in foreign trade to expand so as to increase exports.

In the case of a wage subsidy of the marginal stock variety, however, it should be noted that not all exporting firms will necessarily experience net benefits from the program. Depressed sales in the firm's home market might more than offset the benefits of selling abroad so as to lead to a contraction in the firm's level of employment. In such a case, the firm would not be eligible for a subsidy which was conditioned on the firm bettering its previous year's employment level.

A final point to be made is that the favorable balance of payments effects of direct job creation measures will be offset to a certain extent if these measures succeed in increasing national income. Expenditures on imports tend to be positively related to the level of national income.

Are direct job creation measures economically efficient? Evaluation of the extent to which direct public employment and wage subsidy programs meet an economic efficiency objective requires application of a standard benefit-cost criterion. Here the benefit and cost categories pertinent to direct job creation measures will be set forth briefly.

On the benefit side, there are several impacts of such policies. The most obvious one is the value of the output which will be produced by the workers directly employed by the program. A second benefit is the value of the training and work experience gained by participants relative to that gained in their alternative activity, be it employment or unemployment. An additional set of benefits is also identifiable, though harder to measure. A few examples will make this benefit category clear. Securing income by working may be preferable to unemployment with transfer benefits for the otherwise unemployed worker and, moreover, taxpayers may prefer to grant income support through providing work opportunities as opposed to direct cash transfers. Both of these preferences imply some positive welfare change associated with direct job creation efforts, and both must be reflected in any analysis of efficiency effects.

There are also social costs associated with direct job creation efforts. First, and most obvious, there are the materials, equipment and supplies which are used by the workers and the services of the supervisors and other personnel in the program required to work jointly with them. The value of these inputs may be diverted from alternative uses somewhere in the economy. A second category of cost is similar, i.e., the value of what the workers employed by the program would have been producing if the program had not exis

Some of the workers directly employed would have been working at least part time or part year if the program had not existed. The output which they would have produced in this alternative acitivity may be foregone because of their participation in the program. A reasonable proxy for this lost output is the income which the workers would have earned in the absence of the program. Other workers employed in the program might not have been working at all in regular jobs in the absence of the program. They might have been engaging in various forms of home production--child care (which may have permitted a spouse to work), home improvements, odd jobs which do not enter the market economy, or the production of leisure for themselves. These foregone contributions to economic welfare must also be counted as a cost of the program. It should be noted, however, that these activities which the newly employed workers vacate may be filled by still other unemployed people, hence reducing the social cost in this category.

Finally, there are a number of ways in which direct public employment or wage subsidy programs could displace output and employment in other activities, and if the inputs so displaced do not find alternative uses, an additional cost must be attributed to the policy. One example of displaced inputs relates to the decreased sales of other activities due to the competition provided by the subsidized activity. A second example would be the case in which the funds supporting a public employment program are used to hire workers which would have been hired by regular public agencies in the absence of the program. Finally, displacement could occur because of the financing of the program (which may result in reduced consumption spending

by taxpayers or reduced availability of funds for private capital investment due to increased public borrowing) or because of the reduction in capital expenditures (which may result from the labor-capital substitution stimulated by the program).

A direct job creation program will only increase national economic welfare if the benefits associated with it exceed the costs. In many ways, this economic efficiency criterion is consistent with the employment creation objective. For example, the smaller the displacement effect of the program the larger the number of net jobs it will create. Both program net benefits and employment generated will increase. In other ways, however, the job creation and efficiency goals are inconsistent. A direct job creation program which seeks to operate effectively in transforming inputs into output will tend to have high net efficiency benefits. However, because displacement caused by output competition is likely to be greater in a productive program, such a program may have a lower job creation potency than a less effective one.

As with the previous objectives discussed, public employment and wage subsidy programs differ from each other in their likely efficiency impacts. For a number of reasons, the wage subsidy approach would appear to be the more effective in meeting the economic efficiency criterion. First, private employers already have a known production process and a set marketing channel for the products produced. Partially offsetting this is the fact that privately marketed outputs are more likely to displace other production (in part through policy-induced price reduction) than public outputs designed to fill an unoccupied economic niche. Second, if private employers

use the subsidy to retain workers who they would otherwise lay off, the opportunity cost of the workers retained will be low. On the other hand, as has been noted, direct public employment programs may be better equipped to hire very low skill-low wage workers.[14] Third, to achieve economic efficiency, actual wage rates should equal the marginal opportunity cost of labor. Direct public employment programs, in effect, subsidize labor costs by at least 100 percent of true marginal productivity. Wage subsidies are likely to come closer to subsidizing the difference between observed wage rates and real opportunity costs.

Do direct job creation measures have distributional effects? Even if direct public employment and wage subsidy programs did nothing to further the first four objectives, they might be desirable public policy instruments. As we have noted, the sorts of direct job creation programs considered are those which strive to target incremental labor demands on specific groups in society--low wage-low skill workers, minorities, or those with excess unemployment problems. The effect of such policies is to alter the composition of labor demand, and through it the composition of employment and unemployment. If there is no change in aggregate output because of the policy measures, the implication is that unskilled (or target group) workers will be supplying x units of productivity at the expense of skilled (nontarget group) workers. This substitution, and the possible income equalization which accompanies it, may be desired by society and most easily accomplished by such a restructuring of labor demands.

Such a change in composition unaccompanied by a change in total output does have implications for the effect of the program on the level of total

employment in the economy. Because the productivity of the target group is likely to be lower than that of the nontarget group, direct job creation measures will provide more jobs for members of the target group than are lost to members of nontarget groups--any unskilled worker hired will displace less than one skilled worker. Employment levels will rise and, if induced changes in labor force participation are not completely offsetting, unemployment and the unemployment rate will fall. The extent to which this effect occurs depends, of course, on the degree to which displacement occurs in response to the policy measure.

While it seems clear that direct job creation measures can alter the composition of employment and unemployment, the extent of the change in composition which can be achieved is not so clear. The extent of changed composition depends upon the effectiveness with which the program is focussed on the target groups. The lower the target efficiency, the lower the compositional change. It also depends, especially in the case of wage subsidy policies, on the elasticity of demand for the target group workers. With a low demand elasticity, a wage rate subsidy is unlikely to achieve very much additional employment for the target group, and minimal compositional change will result. The nature of the displacement which occurs in response to the policy is also relevant. If, because of output competition for example, higher skilled workers producing a given product are displaced, the compositional effect will be larger than if other low skilled workers are affected.

Finally, a point made earlier should be repeated. Directly administered public employment programs (as opposed to no-strings grants to public agencies) are likely to enable more effective targetting than are wage subsidy programs.

Private employers will desire to use the subsidy to employ the most productive target group worker which can be found--a phenomena referred to as "cream skimming." To the extent this occurs, the compositional effect and the accompanying income equalization will be reduced.

The Evidence on Direct Job Creation Effectiveness

The focus of economists on wage subsidy and direct public employment programs as instruments for reducing unemployment and creating jobs is relatively recent. Hence, the quantity of evaluative research on these measures is not extensive. Some studies have been done of the impact of these programs on particular variables of interest, e.g., inflation and displacement. Other studies have estimated the overall effect of such policies using assumed parameters and macro-economic or general equilibrium models. Here, we will briefly summarize the studies which have been made. Because of space constraints, these descriptions will not do full justice to the contributions.

What is the inflationary impact of direct job creation measures? The primary analysis focussing on this topic was undertaken by Baily and Tobin (1977), in the context of the general presumption that increases in employment (reductions in unemployment) are positively related to the rate of wage increase. As indicated earlier, this presumption is related to estimates of Phillips curve inelasticity and judgments as to the value of NAIRU. The hypothesis on which Baily and Tobin focussed is that selective (or targetted) wage rate subsidies or direct public employment programs have a smaller inflationary impact than alternative increments in labor demand

which are not targetted--that such selective programs can "cheat" the Phillips curve. The presumption in their analysis is that some categories of workers have flatter Phillips curves than do others, and that by shifting labor demand to these categories, NAIRU can be shifted, inflationary pressures can be reduced in the short run, and the natural rate of unemployment reduced in the long run.

In their analysis, Baily and Tobin employ two models to analyze this impact of selective labor demand measures. The first is an aggregate model in which the level of wage inflation is dependent on both the unemployment rate and the job vacancy rate. The discrepancy between the number of jobs slots created by a policy and the total number of people employed equals the number of vacancies; this reveals the existence of "friction"--in effect, each job slot creates less than one employed person. If each job slot created would increase by one the number of persons employed, friction would be minimized. The model indicates that selective public service employment could reduce this friction (and hence reduce inflationary pressure) by insuring that a job slot efficiently results in an increment to employment by targetting the slot on unemployed workers. In effect, this framework suggests how effective targetting indirect job creation measures will minimize displacement relative to other demand stimulation measures.

In their second model, Baily and Tobin view the labor market as a series of related but segmented markets. In this model, differences in the effective productivities of various types of labor (e.g., high skill vs. low skill) are recognized, the various types of labor are assumed to be imperfect substitutes in production, and wage rate increases of various

types of labor depend inversely on own unemployment rates, those of related labor types, and the relative wage of that labor type. The inclusion of the relative wage term is based on the presumption that, because of both employer and worker behavior, high relative wages for a labor type constrain wage increases for that labor type.

When equilibrium is defined to be the (natural) unemployment rate which just holds wage inflation equal to expectations and which equates wage inflation for each labor type, the model (employed with reasonable parameter estimates) indicates that selective job creation policy focussed on low skill workers will (because of a policy-induced reduction in the relative wage of high skill labor) lead to (1) a net decrease in the number of low skill unemployed, (2) a net increase in the number of high skilled unemployed, (3) a net decrease in the total number of unemployed, and, perhaps, (4) an increase in GNP (i.e., a decrease in wage-weighted unemployment). Hence, at any given (natural) level of wage inflation, an increase of x low skill jobs need effect a reduction of less than x high skill jobs.

Because this model indicates a smaller impact on wage inflation of an x person reduction of low skill unemployment than of an x person reduction of high skill unemployment, Baily and Tobin empirically test the aggregate wage sensitivity of various kinds of unemployment. Their fitted wage equations confirm the hypothesis that a reduction in the unemployment rate of prime-aged workers is substantially more important in determining wage inflation than an equivalent reduction in the unemployment rate of teenage workers. Their results also tend to confirm other aspects of their models, namely that (1) vacancy rates are independent determinants of wage inflation (related to their first model) and (2) the relative wage level of a sector

is negatively related to the rate of wage increase in that sector (related to their second model).

The authors conclude that a reduction of unemployment through selective direct job creation via either below market wage rate public employment or wage subsidy programs will produce smaller increases in wage inflation than a similar reduction brought about by a general expansion of aggregate demand. They emphasize a number of conditions which must be met for this to occur, including the freeing of newly created job slots with unemployed workers (so as to reduce the vacancy component in any job slot), the maintenance of program wage rates at or below market levels (so as to minimize the number of new labor force entrants in response to the increase in demand), and the limiting of tenure on the job and the provision of job placement services (so as to encourage workers occupying such jobs to continue job search, hence reducing wage pressure). Moreover, such policies will also improve the distribution of jobs, irrespective of their impact on aggregate unemployment or wage increases (see below).

What is the effect of direct job creation measures on aggregate unemployment? While the Baily-Tobin analysis was designed to evaluate the inflationary effect of direct job creation measures, it also considers the impact of such measures in reducing unemployment without inducing accelerating inflation rates. As indicated earlier, the model (together with reasonable parameter values) suggests that such measures can reduce aggregate unemployment and, under more demanding conditions, reduce wage-weighted unemployment.

A quite different model has been formulated by two British economists, Layard and Nickell (1978), which also addresses the question of the effects on

unemployment of a particular direct job creation measure. The policy which they analyze is a marginal employment subsidy of the stock variety. This subsidy consists of an $x payment per incremental job, and would not be selective (or targetted) as in the Baily and Tobin case. They analyze this proposal using a static macro-economic model.

In their model, the price level depends on labor costs (via a mark-up arrangement), output depends on real effective demand, and employment depends on real effective demand, and employment depends on output. As a marginal wage subsidy is imposed, the profits of firms will increase, a part of which will be passed forward as lower prices, inducing an increase in real incomes and some increase in domestic effective demand and, hence, in employment. More importantly, firms operating in export markets, being price takers, will be able to compete more effectively, hence expanding their output and their employment. As a result, the balance of payments will improve as the marginal wage subsidy acts, in part, as an export subsidy. Because of the dominance of this export demand effect, the employment impact of the subsidy holds for both the interventionist (Keynesian) and the classical versions of the model.

When reasonable (and upper and lower bounds) are placed on the parameter values of the model, it is estimated that a marginal wage subsidy equal to one-third of weekly earnings will increase employment between .1 and 1 percent. The balance of payments would be improved and prices reduced, albeit at a somewhat increased budget deficit. The number of workers subsidized is taken to be between 3 and 6 percent of total employment. When other expansionary policies (average employment subsidy, general government

expenditure, and devaluation) of equivalent magnitude are compared with the marginal employment subsidy, the latter is seen to dominate on nearly all scores--employment generation, price level effects, balance of payments effects, and government deficit effects. As expected, when the classical version of the model is employed, the government expenditure increase policy has a trivial employment effect.

A study by Fethke and Williamson (1976a, 1976b) also employs a macro model to estimate the employment effects of a marginal wage subsidy employed as a countercyclical device--a "variable base employment credit" (VBEC). Under a VBEC, the base beyond which additions to employment are subsidized would be adjusted downward during recessions and upward during booms in the hopes of dampening oscillations in the business cycle.

To simulate the effects of their proposal on the American economy, the authors employ a standard macro-econometric model, which includes an equation in which the wage facing employers is defined to be equal to the value of labor's marginal product--a notion specifically rejected by Layard and Nickell as being "completely at variance with observed facts." An employment tax credit equal to 1 percent of the wages paid to workers beyond the firm's base-level employment is imposed on the U.S. economy in the fourth quarter of 1975 (that is, the endogenous variables of the model are set equal to end-of-1975 values). Parameter values were assigned from 1975 data and the production function was assumed to be Cobb-Douglas. Some money illusion on the part of workers is assumed and the marginal propensity to consume (MPC) is set equal to .8. (The authors claim that varying the MPC does not change the results significantly.)

Under various definitions of the base level of employment, Fethke and Williamson distinguish three cases: (1) Case 1 in which the tax credit is

financed by borrowing; (2) Case 2 in which it is financed by reducing other government expenditures; and (3) Case 3 in which it is financed by increasing personal income taxes. In all of these cases (and for any base between 0 and 100 percent of the initial employment level) the VBEC results in higher GNP, employment, and real wages. For example, when the wage subsidy is assumed to be financed by an equivalent increase in income taxes and the base is set at 100 percent of the actual work force, real GNP is estimated to increase by .5 percent, employment by 1 percent, and prices are estimated to fall by .4 percent. In all of the simulations, the expansion of aggregate supply offsets the increase in aggregate demand so that the price level is never higher with the VBEC than without it.

The results of this exercise suggest that such a marginal employment tax credit will not serve as a windfall to employers. While the immediate effect of the credit is to lower the cost of labor to the firm, the indirect effects are to increase the wages received by workers and to lower product prices. If this is so, the indirect effects may, in fact, outweigh the direct effects, resulting in a reduction in profits. In the simulations reported, an increase in real profits occurs in Cases 1 and 2, only when the base level is a low percentage of initial employment. In other situations, real profits are reduced.

Using a still different framework of analysis (partial and comparative static rather than macro), Kesselman, Williamson, and Berndt (1977) have also examined an employment subsidy strategy. Their approach was to consider substituting a variety of employment subsidies for an equal cost investment

tax credit (a traditional policy instrument in the U.S. for achieving macro-economic goals). They viewed an employment subsidy as analogous to an investment subsidy, and one which in principle at least would offset the factor proportions bias created by the investment tax credit. The question which they posed is: How effective would employment tax credits be in generating an increased demand for labor, and increased employment?

Their evaluation of this policy substitution views the U.S. manufacturing sector as a single large firm facing an infinitely elastic supply of labor. The "firm" is assumed to have a constant returns, translog production function with three inputs [capital (K), unskilled labor (B), and skilled labor (W)] and a single output. Using 1962-1971 data, elasticities of substitution among the factors are estimated and used to calculate the changes in equilibrium labor and capital demands in a comparative statics framework. K and W are found to be complements, K and B substitutes, and B and W moderately substitutable. From these estimates, Kesselman et al. conclude that the invesment tax credit biases firm input decisions toward K and W, and away from B. The revenue cost of the credit is also calculated in this partial equilibrium framework, as are the price level, and the extent of the input bias.

In a series of simulations employing these elasticities, the effect of substituting a variety of employment tax credit schemes for the investment tax credit is evaluated, assuming no net revenue change to the fisc and unitary elasticity of demand for manufacturing output. As expected, such a substitution does increase the demand for labor, even for a nonmarginal employment subsidy. Not unexpectedly, marginal wage subsidies (with the

margin being defined as the wage bill in period t in excess of μ percent of the wage bill in period t-1) are found to be substantially more powerful generators of employment, with the extent of impact positively related to μ. A subsidy with μ = .5 (.9) generates twice (five times) the employment of the nonmarginal subsidy (μ = 0). The range of impacts of the policy instruments simulated for one-year periods, 1962-71, was from .5-1 percent of manufacturing employment in most of the years. With respect to price level effects, wage subsidies were found to be comparable to the investment tax credit though not quite as effective. Wage subsidies reduced the output price by 0.5 percent on average, while the investment tax credit was found to depress the price of output by 0.8 percent.

While this study verifies the expected direction of impact and employs estimated elasticities of substitution, it is hardly a comprehensive evaluation of this policy instrument. The assumed constancy of wage rates (implying that the full impact of the subsidy is to increase employment) is troublesome, as is the neglect of sectoral and macro (multiplier-accelerator) impacts.

At the time of the passage of the U.S. New Jobs Tax Credit (1977), Bishop and Lerman (1977) conducted a simulation study stimilar to that of Kesselman et al. designed to estimate the effects of the new policy on employment and prices. In their simulation, Bishop and Lerman used estimates of the short-run wage elasticity of demand for labor and of various elasticities of factor substitution which have been obtained in recent econometric investigations. They take the short-run wage elasticity of demand, holding output constant, to be about -.15, based on the survey of estimates of this value

by Hamermesh. Various sets of elasticities of substitution are employed, with the preferred set taken from a study by Berndt and Wood (1975)--a materials-labor elasticity of .61 and a materials-capital value of .49. In addition, the elasticities of Kesselman et al. for substitution among capital, white-collar labor, and blue-collar labor were employed. Whereas the above elasticities were obtained from econometric work, price elasticities of demand for capital goods (-.5) and consumption goods (1.0) are merely assumed.

The simulation model employed presumes marginal cost pricing. Separate production functions are defined for the 204 detailed industry categories of the Census of Population. Each industry is then divided into 10 firms of equal size and each firm is assigned an exogenously given growth rate in employment demand. The within-industry standard deviation of these growth rates is .15 in the simulations of the impact in the first year and .40 and 1.0 in the simulations of 4-year and 10-year impacts. Every firm which may profit from the wage subsidy because of exogenous growth in employment demand is assumed to take advantage of it. Among the rather substantial number of underlying assumptions, this appears to be the only one tending to overstate the impact of the subsidy.

The simulations conducted predict strong effects from the tax credit. Using their preferred values for the various elasticities, the authors predict an almost immediate reduction in prices of 1.78 percent and a 4.6 percent increase in employment--equivalent to 3.7 million jobs. A part of the reason for this large increase is that the tax credit encourages substitution of low paid workers--workers who are unskilled or who work only part-time--for higher paid workers in a situation in which the substitution

elasticities are substantial. Although wage-weighted employment demand increases by a smaller amount, Bishop and Lerman predict a 2 percent growth in the total wage bill which amounts to two-and-a-half times the value of the subsidy, as measured by the reduction in taxes. The budgetary cost per job created is $2310, which the authors claim is less than 25 percent of the cost of the most efficiently run program for direct public employment.

As the authors admit, the simulations do not take into consideration the fact that the tax credit is a temporary one. As such it encourages the building up of inventories and the undertaking of deferred maintenance work. When one fully accounts for the possibilities of utilizing part-time labor, the authors suggest that their simulations may understate the probable impact of the New Jobs Tax Credit.

Another simulation study has been undertaken by Hamermesh (1978) posing the question: What would have been the 1-year employment effects of a wage subsidy introduced in the United States in mid-1974? Because the 1974-75 period was one of higher-than-average unemployment, the Hamermesh simulation, in effect, views wage subsidies as a countercyclical measure.

In this study, the private nonfarm economy is decomposed into its 171 two, three, and four-digit SIC industries, each industry being viewed as a single firm. The hypothetical job creation program simulated consists of a tax credit for 1975 employment which is in excess of 1974 employment with the credit amounting to 10 percent of the wages subsidized. Additional simulations analyze the effects of the subsidy paid on 1975 employment in excess of 85, 90, or 95 percent of 1974 employment.

It is assumed that financing for the program is provided by the same mix of fiscal and monetary measures in effect before its introduction. The supply of labor is assumed to be perfectly elastic, while the author alternatively employs elasticities of labor demand equal to -.1 and -.3. These are viewed as bounds on the actual labor demand estimates.

As expected, eligibility rules which require that firms exceed their 1974 employment levels to qualify for a credit result in little net job creation. Requirements that firms only exceed 85 or 90 percent of their base period employment levels do result in a substantial increase in jobs created. In these cases especially, much of the cost of the program constitutes a windfall to employers. Nevertheless, the budgetary cost for each job created (not taking into account savings in transfer program costs and increments in tax revenues from the additional employment) is quite low. If the elasticity of labor demand is assumed to be -.3, the credit paid on employment in excess of 90 percent of the base period level requires budgetary outlays of $5725 per job (in current dollars). Even if the elasticity is set at -.1, the $15,816 per job price tag is less than that for general government purchases or tax cuts.[15] Thus, even if the demand for labor is assumed to be highly inelastic, a 10 percent subsidy for employment exceeding 90 percent of its base period level entails a per-job cost that is not significantly higher than other programs.

The most recent empirical analysis of the employment impact of a wage subsidy is reported in papers by Bishop (1979) and Bishop and Haveman (1979). The authors focus on the New Jobs Tax Credit in an effort to determine if

the policy had a statistically significant relationship to employment and price changes of the period in which it was in effect. The specification employed assumes that the demand for labor at time t is a function of expected sales, expected real wages, expected real prices of other inputs, and employment at time t-1 (to reflect adjustment costs).

The preferred model, in which wages enter in relative rather than in nominal terms, assumes that input price ratio expectations are formed solely on the basis of current and lagged information about input price ratios. This specification implies that a simultaneous n percent increase in all input prices leaves current and all future employment levels unchanged. Normal average cost pricing is hypothesized to prevail.

Economic theory predicts interesting consequences from such pricing when a marginal employment subsidy is imposed. Because of its marginal nature, the credit gives new firms a cost advantage vis-à-vis old firms. As a result, the "limit" price for oligopolists which would forestall entry of new firms must decline by more than the decrease in oligopolists' average costs. In this way, the tax credit may serve to undercut market power.

Using a February 1978 Census Bureau survey which asked firms if and when they knew of the tax credit, the impact was estimated assuming that 6 months were required for firms to respond to the credit once informed of its existence. For each industry examined, only the proportion of firms (weighted by employees) deemed by the survey as informed of the credit was assumed to take advantage of it.

The estimated overall impact of the credit was obtained by summing the estimates of the net effects in each industry. The model employed thus captures intra-industry displacement effects, but not displacement across industries stemming from economy-wide price, wage, and profit adjustments.

Monthly data on input and output prices, hours worked, and sales or output were used in regressions predicting employment levels for various industrial sectors. The author is most confident of the results for regressions with three-year lags on sales and wages, the rental rate on capital and materials input prices. In the preferred model, the hypothesis that the tax credit had pro or negative effects on 1977 employment in construction and retailing and for the industry subaggregates for Apparel, Food, Furniture, and Other Retailing was rejected at the 5 percent level. The overall net increase in employment owing to the credit was estimated to be 470,000 jobs.

Regressions predicting the log of hours worked per week consistently showed the credit to have had a negative impact for retailing. Negative coefficients which were statistically significant were obtained for Other Retailing, Food, Furniture, and General Merchandising. The percentage increase in manhours worked resulting from the credit thus seems to have been less than the percentage increase in employment. These results are consistent with the expectation that such a marginal stock employment subsidy will encourage the substitution of additional workers for overtime work.

Finally, Bishop (1979) estimated price effects. The effects of the tax credit in most industries, even for those in which the payroll constitutes

a small percentage of sales, seem to have been negative. The industry with the highest payroll costs, restaurants, had the coefficient which was largest in absolute value. Taking the regression coefficients at face value, the total price savings to consumers was calculated. In the distribution sector firms are estimated to have received less than $2.5 billion in tax savings whereas price reductions are estimated to have aggregated to more than $4 billion. On this basis, the author concludes that consumers and workers have received benefits in excess of the gross tax revenue cost of the program.

While the models for analyzing the effects of direct job creation programs discussed in this section and the previous section provide some evidence on the effects of a wage subsidy policy on emplloyment, output, and prices, none of them (with the possible exception of that of Baily and Tobin) examines these measures in terms of a full general equilibrium framework. Use of such a framework seems essential if the full set of interactions in the economy which determine the net effects of such a policy are to be distinguished.

Initial efforts to construct such a model have recently been made by Bishop, although by viewing the economy as a single firm, several of the avenues of potential substitution are suppressed here as well. While this model may capture the existence of intra-sectoral displacement via factor substitution, it fails to examine inter-sectoral displacement. Another possible approach would involve the application of a multi-factor, multi-sector micro-data simulation model to a wage subsidy program.[16]

What is the displacment effect of direct job creation measures?

The impact of direct job creation measures on employment levels depends upon the extent to which the creation of job opportunities for some individuals is associated with reductions in the employment of others. This was earlier referred to as the displacement effect. Ultimately, of course, this issue of displacement is a macroeconomic issue--it concerns the impact of a policy on net job creation in the economy. Its full analysis, therefore, requires a fully specified macroeconomic model, such as that developed by Layard and Nickell, or a multisector general equilibrium model. Partial analyses of the net job creation impacts of direct job creation measures have, by and large, neglected economic repercussions beyond the enterprises (activities) directly affected by the policy, inquiring only into the behavioral response of the activities subsidized.[17] Net job creation in this context, then, refers to the displacement response only in these impacted activities.

Empirical work on this first-round displacement issue has been undertaken by Johnson (1978), Johnson and Tomola (1977), and Greenberg (1978). While the paper by Johnson and Tomola is an empirical examination of the effects of job creation measures recently undertaken, the papers by Johnson and Greenberg attempt to simulate the displacement response.

In his 1978 paper, Johnson develops a model in which the labor force is partitioned into two sectors--skilled labor and unskilled labor. The wages of unskilled labor are assumed to adjust sluggishly to conditions of excess supply in the short run, but are flexible over longer periods. Johnson also assumes that occupational choice responds to relative net incomes in the long run.

In the model, aggregate output depends only on the employment levels of the two types of labor in a linear and homogeneous production function in which questions of capital-labor substitution and the potential output effect on the demand for labor are ignored. The focus is on the substitution possibilities between skilled and unskilled labor.

Under the usual requirement that producers maximize profits subject to the production function and factor prices, Johnson explores the effects of subsidizing unskilled employment. This is done for various values of the following parameters: the elasticity of relative labor supply, the elasticity of substitution between skilled and unskilled labor, the slope of the Phillips curve for unskilled labor, and the "replacement ratio" (which indicates the fraction of net income lost due to unemployment which is replaced by society through transfer programs).

While the relative demand curve for unskilled labor undoubtedly shifts to the right in response to, say, a wage subsidy targetted on this labor class, Johnson arrives at results which depend strongly on the time period in question. In the short run, before the wage rate of unskilled labor adjusts to excess supply, employment and output increase significantly. If there were no tendency for the unskilled wage to adjust, these results would also obtain in the long run, and imply a durable increase in the employment of unskilled workers. However, if wages adjust rapidly and if labor supply responds to wage differentials, there may be no gains to employment over a longer period and output will be lower due to a reduction in skilled labor.[18] In this case displacement will be total and net job creation will be zero.

A similar dichotomy between short-term and long-term effects is obtained by Johnson and Tomola in their study of recent public employment programs.

Examining the U.S. Emergency Employment Act of 1971 [later renamed the Public Employment Program (PEP)] and the U.S. Comprehensive Employment and Training Act of 1973 (CETA), the authors find that, within the public sector, there was little displacement during the first few quarters of these programs, but that after five quarters, there was nearly a 100 percent displacement effect. This estimate was based upon a regression model in which state and local employment is dependent primarily on (1) the number of public service jobs, (2) state and local income, and (3) the real wage rate of state and local government employees. The model employs an Almon lag structure which describes the time pattern by which changes in the independent variables affect state and local employment. The 100 percent displacement result indicates that after 5 quarters variables other than the number of public service jobs were explaining changes in total state and local employment.[19] Hence, substantial short-run employment was created by the program, with little increase in the long-run equilibrium level of employment.

The authors emphasize that their study focusses on only intra-public sector rather than economy-wide effects, but note that a given increase in expenditure on public service employment should have the same effect on private sector demand as a tax cut of equivalent size. On this basis, they suggest that the net job creation within the public sector will approximate that in the economy as a whole.

In a second analysis, Johnson and Tomola analyze the effect of national subsidy measures on the employment demands of local communities. They employ a conceptual framework in which the welfare of communities depends on

the consumption of private goods and services and the flow of services produced by local government. This is maximized subject to the constraint that the local government budget be balanced and subject to a government production function.[20] First-order conditions imply a demand for employment which is a function of the net income of the community and the wage rate. Hence, the crucial parameters for evaluating the effect of a direct job creation policy are the corresponding income and wage elasticities.

Public service employment programs can be viewed as a form of disguised revenue sharing with certain restrictions on how grants can be used. The issue then is whether the community wishes, subject to federal restrictions, to spend what amounts to an increase in its net income on a greater quantity of government produced goods, or simply view the grant as a tax rebate to be spent on private goods. Based on their estimates, Johnson and Tomola find that as the effectiveness of federal restrictions diminish over time, the community will view the subsidy as an opportunity to reduce taxes, driving the effect of the wage subsidy toward zero.

In his study, Greenberg addressses a rather different question: Given a public service employment program, how many people would wish to participate? This question is relevant to the displacement issue in that a program might attract not only unemployed and discouraged workers, but currently employed workers as well. If the wage rate paid in a public employment program is relatively high, private sector wage rates may be bid up by employers fearful of losing some of their labor force. But higher wage rates may also lead to a reduction in the quantity of labor demanded by private sector employers.

Greenberg focusses on how husbands and wives in intact households behave in response to various job creation measures if they were in operation

in one particular year (1973). The population of labor supplied to an open-ended public employment program is evaluated for four different hourly wage rates: $2.00, $2.50, $3.00, and $3.50. (The federal minimum wage in 1973 was $1.60 per hour.) The alternative programs analyzed also have maximum hour restrictions (20, 30, or 40 hours per week) and a required waiting time for participation (5, 13, or 26 weeks). Most of the simulations assume that no constraints exist on the length of time one may spend in the program.

Under the assumption that individual labor suppliers maximize discounted earnings, Greenberg simulates the supply responses to various programs using a nationally weighted micro-data base of 50,000 families. For the purpose of estimating the potential supply population for public employment, one must know what fraction of those receiving program-induced wage increases would remain in their present position and what fraction would transfer to the public employment sector. On an individual level, these fractions indicate a worker's probability of remaining in his present position and the probability of moving to the public employment sector. Greenberg developed a formula whereby the former can be determined by dividing the number of hours desired to work at the program wage into the number of hours of conventional work that the individual can find after wages are bid up by the program. The elasticity of demand for labor in the nonpublic service sector is alternately assumed to be $-.5$, -1, and $-\infty$.

The simulations conducted indicate that the labor supply to the public service jobs program is very sensitive to the wage rate offered; even relatively low wage programs could attract a substantial number of workers.

Not surprisingly, the response is also positively related to the number of weeks of work available, and inversely related to the required waiting time for participation. These latter effects, however, are less volatile than the wage effects.

At the lowest program wage rate ($2.00), a large proportion of the program participants would be individuals who were formerly unemployed, implying a small amount of first round displacement. However, it is likely that even some of those workers would eventually return to conventional jobs over time. At higher wage rates, significant numbers of currently employed workers would leave their present jobs in order to become participants. The results also imply that wives who would not otherwise be in the labor force, will enter at high wage rates and attempt to participate in the program. Thus, a key question with respect to the extent to which persons other than those currently unemployed would become program participants concerns the narrowness of the targetted groups.

It should be pointed out that the study ignores macroeconomic effects and nonwage factors entering employment decisions. Thus, although the displacement effects of high wage public service programs appears substantial, the "vacuum effect" of private employers seeking to replace those who migrate is not estimated. It should also be noted that 1973 was a year of relatively high employment.

Do wage adjustments erode the effectiveness of job creation measures?

The issue of the extent to which jobs created through selective wage subsidy and public employment programs will be offset by displacement effects is linked to the issue of the responsiveness of relative wages to changes in

excess supply. One of the important rationales for these programs is the presumed "stickiness" of wages for target-group workers, which permits the increase in labor demand from these programs to stimulate employment without driving up wage rates.[21] If the wages of target groups rise in response to policy-induced demand increases, subsidies for employment will merely lead employers to bid up wages in the subsidized sectors with any net gain in employment dependent on the elasticity of labor supply. If, on the other hand, wages respond sluggishly, properly targetted subsidies could reduce unemployment, at least in the short run.

The question of wage adjustment and its relation to direct job creation measures has recently been addressed by Johnson and Blackemore (forthcoming). Using 1970 and 1977 data which admittedly embody a high degree of aggregation, the authors conduct two separate tests of the hypothesis that relative wages exhibited flexibility over the 7-year period.

The first test employed is an indirect one. If there is wage adjustment then it should be the case that, between two periods when unemployment is at its natural rate, the rate of growth of employment for various labor force groups should equal the rate of growth in the labor force for these groups. If, however, adjustment is incomplete, the rate of growth of employment for some labor force groups will be less than the corresponding growth rate in the labor force.

The overall unemployment rate in 1970 was 4.9 percent, which the authors take to have been fairly close to the natural rate at that time. In 1977, however, the overall unemployment rate was 7.0 percent, which the authors

believe to have been 1.0 to 1.5 percentage points higher than the natural rate for that year. Thus, owing to cyclical unemployment, the rate of growth of employment was less than the rate of growth in the labor force for all demographic groups studied.[22] Adjusting for the above-natural-rate level of unemployment of the latter year, Johnson and Blakemore find that, with the exception of young blacks, relative wages appear to have adjusted over this period. That is, discounting the cyclical unemployment of the latter year, all demographic groups examined except minority youth exhibited near-perfect correspondence between their respective employment growth rates and their respective labor force growth rates.[23]

The employment growth rate for black youths was about two-thirds that of their labor force growth rate. From this, the authors suggest that if 100 jobs were created by direct job creation measures targetted at black youths, about 67 conventional jobs would be displaced, yielding net job creation of about 33 jobs. Measures targetted at other groups, however, would result in displacement of conventional jobs on nearly a one-to-one basis.

A second more direct test, based on earnings data constructed by Michael Wachter for year-round, full-time workers, gives even stronger results. This second test considers only 14 age-sex categories; the data are not broken down by race.

The first question addressed with these data is whether relative wages react to changes in relative supplies. To answer this question, Johnson and Blakemore regressed changes in a group's wage rate on changes in the size of the labor force of that group. They found that over the

1970-1977 period, a 10 percent increase in the labor force of a particular demographic group could be expected to, ceteris paribus, depress that group's wages by about 4 percent from what they otherwise would have been. From these results, the authors conclude that relative wages do tend to adjust to changes in labor supply.

A related question is whether a group's relative wage affects its unemployment rate. To answer this, Johnson and Blakemore must be highly qualified on several grounds. First, their data is extremely aggregated. Wages for minority youth did not show adjustment in the first test, and there may well exist other pockets of workers for whom relative wages did not adjust during the period. A finer disaggregation in the data might reveal such pockets. Moreover, 7 years is a fairly long adjustment period. If such adjustment is incomplete over, say a 4-year period, a potential for targetted job creation subsidies would still exist. In this case, however, the gains in employment to be traded off against some upward price pressure would be temporary ones. A more serious problem with the Johnson and Blakemore estimates concerns the specification of the regression models employed by them. The notion that relative wages react only to relative labor supplies is overly simplistic, and moreover fails to recognize that both the dependent and independent variables are themselves endogenous variables.

The role of union power and negotiating arrangements must also be considered in evaluating potential dissipation of policy impacts through wage and price increases. For example, it has been argued by Burton (1977) that any analysis of long-term employment and wage impact of wage subsidies must

contend with the fact that, in response to such programs, unions may become more aggressive. In this framework, firms confront unions with a demand curve for labor which services as a constraint on the attempt to maximize a utility function whose arguments are wages and employment. Employment subsidies shift this demand curve to the right, implying a more favorable trade-off for union activity. If unions come to expect the provision of subsidies, they will bargain on the basis of the corresponding expectation that the demand for labor is greater than would otherwise have been the case. This will result in larger-than-otherwise wage demands and suggests that policymakers must provide ever-larger subsidies if their program is to have the desired effect on employment. The implications of this view are similar to those of analyses which contend that efforts to utilize direct job creation or aggregate demand policies to lower the unemployment rate below its "natural" level will be dissipated through wage and price inflation.

What are the compositional effects of wage subsidy and public employment programs? While the overall employment and price effects of job creation measures are important factors in assessing their desirability, the effect of the policies on the distribution of employment among various socioeconomic groups is also an important consideration. Many proponents of these measures might judge them successful if they they merely reallocated a constant stock of employment opportunities toward those at the the low end of the skill distribution.

An important question to be asked in this connection is: If programs are not targetted on specific groups, who would participate in them? Greenberg's

simulations for hypothetical public employment programs in 1973 suggest that, if eligibility is not restricted to certain groups, only a small percentage of public employment positions would be filled by members of low-income families. This is especially true if wives of husbands with relativley high incomes are eligible for jobs. The results obtained by Greenberg suggest that the supply population would be largely made up of middle-aged persons who live in moderate-sized, two-parent families, and in husband-wife families without children. The last group would account for about 25 percent of the participants.

Although such nontargetted public employment programs would not tend to benefit low-income families, it is nevertheless true that persons with limited earnings potential would be attracted to public employment in disproportionate numbers. In Greenberg's simulations, grade school and high school dropouts supply more than half the person-years to public employment programs. Residents of central cities, rural areas, blacks, and southerners also tend to be disproportionate demanders of job slots.

While these general findings hold over a range of wage rates stipulated for the program, other compositional effects were sensitive to the wage rate used. At low program wage rates, most program participants would be unemployed workers. At high wage rates, however, a disproportionate number of currently employed black males and females not in the labor force apply for positions. While many would consider the effect on males to be desirable in view of their low average education, the females attracted to the jobs are more likely to be from upper income families and are disproportionately white.

As has been noted, the study by Johnson and Blakemore on wage adjustment over time was generally pessimistic regarding the overall employment effects of wage subsidies. They did, however, find that wages adjust sluggishly for minority youth. This suggests that wage subsidies, besides redistributing income, could induce a substantial redistribution of employment opportunities toward this group. Whereas the adjustment of wages for other groups brings about substantial displacement effects, subsidies for groups with slowly adjusting wage rates would seem to have great potential.

The simulations conducted by Kesselman et al. and by Bisho and Lerman are similarly optimistic regarding compositional effects, even for general wage subsidies as opposed to targetted programs. With their estimated elasticities of substitution among capital, white-collar, and blue-collar labor, Kesselman et al. found the U.S. investment tax credit of 1962 to have been detrimental to blue-collar employment. An employment subsidy, however, not only favors labor but favors blue-collar labor for two reasons. First, to the extent that substitution away from capital is encouraged, blue-collar labor gains in that white-collar labor tends to be a complement rather than a substitute for capital. Second, more workers are required to produce a constant level of output if it is produced primarily by blue-collar workers than if capital and white-collar workers are dominant in the production process. Total employment of blue-collar workers could change significantly even if wage-weighted employment does not.

Using the same estimates of elasticities of substitution (as well as additional estimates by Berndt and Wood), the Bishop and Lerman simulation study reaches similar conclusions. In view of the eligibility requirements

for the marginal employment subsidy, the U.S. Jobs Tax Credit provides incentives to substitute low paid, unskilled, and part-time workers for higher-paid workers. As with the previous study, this produces the discrepancy between the growth in employment demand produced by the program and the estimated increase in the wage bill.

Clearly, if certain compositional effects constitute a primary goal of job creation measures, policy measures should be selective, rather than general. Baily and Tobin note that gains in unemployment counts through the subsidy-induced substitution of low-skilled for high-skilled workers are much easier to achieve than increase in GNP. Not only would selectively employed wage subsidies have immediate beneficial results for the targetted groups in terms of the distribution of income and jobs, there would also be longer-term benefits with respect to human capital acquired via on-the-job training.

The most serious attempt to study the compositional effects of actual job creation programs has been Johnson and Tomola's examination of the PEP and CETA programs. The initial evidence regarding the distributional effects was mixed. Whereas participants in these public service employment programs have tended to be young and are disproportionately drawn from minority groups, they are also more educated and less likely to be women than the average work force.

In an analysis of compositional effects, Johnson and Tomola used 1970 Census data on unemployment rates for 346 age-education-sex-race cells. The overall unemployment rate in 1970 was 4.9 percent, which the authors take to have been approximately equal to the natural (equilibrium) rate at

the time. They then estimate the equilibrium unemployment rates for various age-education-sex-race combinations. Given their demographic characteristics, the estimated average unemployment rate for participants in the two programs were 5.8% for PEP and 5.2% for CETA, leading to the conclusion that participants in these programs have been, on average, only slightly less employable than members of the labor force in general. However, the equilibrium unemployment rate for workers in the state and local government sector (the sector affected by PEP and CETA) was calculated to be 3.6%. Thus, the authors believe that program participants have been substantially less employable (in the long run) than average state and local government employees.

The findings by Johnson and Tomola must be qualified in two important respects. First, individual characteristics were assumed to affect the rate of unemployment additively. Thus, being black increase's one's unemployment rate by a certain percentage regardless of one's age, sex, or education level. If black participants in PEP or CETA have been more likely to have lower education levels than all participants taken together (as one would suspect), then the estimated equilibrium unemployment rate for participants is, all other things equal, biased downward. Conversely, if black participants have tended to have high education levels, the estimated equilibrium unemployment rate is biased upward. Bias may also enter because the average value of unobservable characteristics such as ability and motivation may vary across groups.

While discounting the possible biases leads to a conclusion that there have been significant compositional effects, Johnson and Tomola suggest that the programs studied may have been ultimately neutral with respect to the

skill-distribution of labor demand. State and local government tends to be skill-intensive in nature. The fact that there was initially a small fiscal substitution effect toward PEP and CETA leads the authors to believe that state and local governments lowered their hiring standards in order to accommodate the introduction of these programs. Over time, however, Johnson and Tomola hypothesize that the ever-larger fiscal substitution effects observed may reflect an unwillingness to retain non-program, low-skilled workers so as to render the ultimate compositional effect (vis-à-vis skill) ambiguous.

5. EVALUATION RESEARCH ON PUBLIC EMPLOYMENT AND WAGE SUBSIDIES

To this point, the general analytics of and empirical work on direct job creation measures have been emphasized. With but few exceptions (e.g., the Johnson-Tomola work on the displacement effects of CETA), there has been little explicitly evaluative research designed to estimate the efficiency, employment, or equity effects of direct job creation measures. This is particulary true in the European context. In this section, we will first summarize briefly the relevant evaluation research which has been undertaken or which is underway in European countries. Then, a few suggestions regarding evaluation research needs and possibilities will be presented.

Evaluation of Direct Job Creation Measures

A relatively thorough search among relevant government agencies and university analysts in Great Britain, Sweden, the Netherlands, West Germany, and France uncovered a limited number of evaluation research studies directed at public employment or wage subsidy measures.

In 1976, the Nordic countries initiated a research project focussed on the youth unemployment problem. The project was primarily aimed at the gathering and exchange of information on the nature, causes, and severity of the youth unemployment problem in the countries surveyed. It also studied the possible policy approaches to remedy the problem. The study, however, was in the form of a listing of options and some of their merits. No effort was undertaken to measure the effectiveness of alternative approaches or to appraise quantitatively their benefits or costs.

A second set of studies has been undertaken by the Expert Group for Labor Market Research in the Department of Labour in Sweden. With respect to wage subsidies, their reports consist of budget cost estimates for various labor market policies and rough estimates of the number of workers assisted or employed by the policies. The growth of programs in the context of overall unemployment levels is emphasised. No evaluations of displacement effects or of social costs per worker employed seem to have been made.

The Expert Group has sponsored a number of more basic labor market research activities, however. Four large completed projects have dealt with the following topics: (1) the economic effects of immigration to Sweden, (2) benefit-cost evaluation of manpower training, (3) the economic and social effects of geographic mobility, and (4) the transfer of information from the employment service to individual and firms.

Of these studies, the one most closely approximating an evaluation study of direct job creation measures is the benefit-cost evaluation of manpower training. In this study, a sample of persons in training programs in four counties in 1968 was compared with a control group of

persons registered with the Employment Service. An observation period of 2.5 years was used to trace the earnings records of the two groups. The results of this study indicated that the trainees had major increases in earnings (mainly from increased employment) relative to the nontrainees, although very little gain in wage rates was experienced. Because of the earnings gain, it was estimated that the loss of earnings during the training period would be more than made up in the 2 years of increased employment after the training period. This comparison, however, focusses on the effect of the program on individual workers. For society, the comparison of benefits and costs was not so favorable: only in the very long run, it was concluded, might the social benefits of the program exceed the social costs. If a rough estimate of "vacuum effects" of the increased employment of the trained workers is added to the direct earnings increases, it was concluded that 5 years would be required for the social benefits to exceed the costs.

In the United Kingdom, the Research and Planning Division of the Department of Employment has undertaken studies of the primary employment subsidy programs implemented in recent years.[24] By mid-1978, studies have been made of the Temporary Employment Subsidy, the Small Firms Employment Subsidy, the Job Creation Program, and the Work Experience Program. The primary research method is that of a survey of firms participating in the program. For example, the survey employed to evaluate the Temporary Employment Subsidy program resulted in tentative answers to questions regarding (1) the extent that the planned-layoffs, serving as the basis for the subsidy, would have actually occurred (usually all), (2) the net costs to

the public budget (greater than if the workers covered had been representative of the work force) (3) the extent of displacement through sale of the output produced (about 30 percent of the firms surveyed indicated such displacment), and (4) the adverse effect on input suppliers if the lay-offs had occurred (modest). These conclusions, it should be noted, are based on the responses of firms to survey questions.

In the evaluation study of the Small Firms Employment Subsidy an experimental approach was used to compare employment changes in the subsidized firms with a control group of similar but unsubsidized firms. The primary purpose of this analysis was to estimate the "natural" employment growth in the subsidized firms and, hence, to estimate the net employment expansion which could be attributed to the program. The best estimate is that 2 out of every 5 subsidized jobs represent employment increases attributable to the program. The displacement effect estimated by this procedure is the more limited intra-firm displacement discussed earlier. It does not capture the other forms of displacement which may reduce the net employment impact of the subsidy still further.

In West Germany, an on-going program of labor market research has been undertaken by the Federal Employment Institute in Nuremburg, in the Institute of Employment Research. The research program of the Institute is a broad one, and involves investigations by both Institute staff and grantees. The research areas include sectoral and occupational employment changes over the business cycle and with economic growth, the effects of technological development on labor markets, job content and employment structures, and the nature of unemployment and other labor market statistics. Little direct evaluation research on existing programs appears to be sponsored by the Institute.

One of the most explicitly evaluative studies of direct job creation policy in West Germany has been undertaken by Schmid (1977), who has analyzed the Wage Cost Subsidy Program described earlier. His study analyses the distribution of the subsidy expenditure in its many dimensions (industry, region, demographic characteristics), and evaluates three aspects of the effectiveness of the program. These three aspects are: its potential utilization by unemployed workers (about 22 percent of the unemployed resided in regions eligible for the subsidy), the net employment effect of the program after accounting for windfalls, displacement effects, multiplier impacts, and fraudulent claims (the net employment effect equals about 25 percent of the jobs created), and the net budgetary cost of the program (about 40 percent of the gross public expenditure on the program).

In the Netherlands, only a few efforts to evaluate the impacts of direct job creation measures have been undertaken. In one study, three job creation measures were evaluated (including the 30 Percent of Wage Cost Program), largely on the basis of a survey questionaire to workers and employers and other data supplied by the Ministry of Social Affairs. A number of questions were addressed in this research, including the extent to which information on the program is available, the likely response to various subsidy levels, the demographic characteristics of subsidized workers, durations of employment provided, and the extent to which the subsidized workers were drawn from the pool of unemployed. Little attention was given to some of the more basic impacts such as displacement, net budgetary cost, price, or economic efficiency effects.

An additional study is a benefit-cost evaluation of the Social Employment program by Haveman (1978). The program studied employs

70,000 workers-most of them handicapped or older workers--in 150 municipally operated enterprises. The program has experienced substantial recent growth, and is viewed as an employment alternative for hard-to-place workers released from their jobs in the recession of the 1970s.

This study obtained estimates of worker productivity and costs from comprehensive enterprise data, and supplemented this information with additional data sufficient to estimate the social benefits (except for the socio-psychological benefits) and social costs of the program. The balance sheet for this program was not favorable--it was concluded that in 1973, the net costs of employment in the program averaged $2000-$2400 per year. Only if the socio-pscyhological benefits per worker exceeded this value could the program be considered a socially efficient one. Part of the explanation for this low net productivity concerned the weak incentives for efficient management and cost control inherent in the national-municipal financial arrangments of the program.

Some Suggestions for Further Evaluation Research

In earlier sections of the paper, some of the principal potential effects of direct job creation measures were distinguished. Relative to the magnitude of such programs in Western Europe, little in the way of quantitative evaluations of program impacts has apparently been undertaken. In this section, we make a few suggestions for new research approaches.

General equilibrium and disequilibrium modeling. As we have emphasized, a full analysis of the employment, wage, and price effects of wage subsidies requires that the relevant relationships in the economy be captured in a

general model. Although Bishop has initiated work on a full general equilibrium model, a number of the potentially important channels of impact have been suppressed in his analysis. The development of a more complete framework, designed for the analysis of such policies, would appear to be of high priority. Such theoretical modeling efforts could well be of the more traditional general equilibrium variety, or perhaps more realistically, they should reflect the disequilibrium character of factor and many product markets.

While these comments pertain to theoretical modeling efforts, it should be noted that a number of multisector, multimarket microdata models have also been recently developed. Such models would also seem adaptable for the evaluation of the economic effects of direct job creation programs. However, because direct job creation programs directly affect labor markets, reliable estimates of their impact rest on the accuracy with which the structure of these markets is captured. The crudeness of the labor market specification of these models is one of their major deficiencies.

Estimates of aggregate parameters. Evaluation of the program effects on aggregate employment, the rate of inflation, and the composition of employment requires estimation of the performance of the entire economy with and without the policy in place. Macroeconomic and simulation modeling efforts, along the lines of the Layard and Nickel study, the Kesselman et al. study, and the Bishop and Lerman study, are required for such evaluations. And, in turn, accurate estimates of crucial economic parameters (e.g., elasticities of labor supply and demand and the elasticity

of substitution among factors) are required if such analyses are to be convincing. Another important line of research, then, would be the estimation of these relevant parameters, and their incorporation in models amenable to simulation analysis. While this sort of research is basic and long term in nature, only such estimates can yield a full, global evaluation of the effectiveness of wage subsidy and public employment programs.

Evaluation of program efficiency. A less global, more partial equilibrium approach would accept a particular program as its focus and attempt to evaluate the streams of social benefits and social costs stemming from the program. The basic benefit-cost methodology implicit in this approach would seek to identify the number and productivity of the jobs created by the program, the displacement of alternative activities due to the created employment, the alternative employment activities and earnings levels of participants in the program, and the real costs associated with the employment provision. The Swedish evaluation of manpower training and the Dutch benefit-cost study of the Social Employment program are examples of such analyses.

It would appear that several of the Western European countries have now had wage subsidy or public employment programs in place for a sufficient length of time to warrant such an evaluation.[25] Moreover, several of the programs are of a magnitude to make an extensive evaluation a worthwhile activity, yet not so large as to preclude a partial equilibrium approach. As with both the Dutch and Swedish studies, reliable estimates of displaced employment and productivity--estimates which are likely to account for a sizable program impact and, hence, are essential to a full evaluation of

efficiency--will be the most difficult to achieve. Such displacement effects are seldom reflected in the estimates of first-round (or direct) jobs created or impacted by the policy, which estimates are the only evaluations available for most direct job creation programs.

More limited evaluation studies. Given the magnitude of the difficulties involved in developing full scale macroeconomic or benefit-cost evaluations, studies with more limited objectives would seem to be in order. One such approach would seek to test the job creation effectiveness of regionally based wage or employment subsidy programs. The effort here would be to estimate the employment in target regions (or target firms) with and without the program. A crude approximation of this would be to compare this gain in employment in the target region during a specified period with the gains in nontarget regions, or more specifically, nontarget regions with characteristics similar to the target regions. By identifying analogue regions in which ex ante employment prospects are similar to those of target regions, a reliable estimate of program impact could be made.[26] It is this approach which was followed in the British evaluation of the Small Firms Employment Subsidy Program (see earlier discussion).

A second approach might be to focus on the target groups themselves in evaluating the effectiveness of categorical programs. Assume, for example, that micro-survey data was available before, during, and after a categorical employment program (one, say, focussed on youths). A straightfoward, yet potentially revealing, study would be to trace the patterns of wage rates, unemployment rates, occupational structure, and industrial structure of the target group and a number of nontarget groups from before to after the

program. If the program is of sufficient scale and effectively targetted, such an inter-group comparison over time could reveal the impact of the program on total target group employment, displacement patterns, and the composition of employment. The variables to be investigated in such an analysis would include the changes in relative wage rates and unemployment rates between target and nontarget groups over time and changes in the composition of target vs. nontarget groups employment in various industries and occupations over time.

In addition, because the extent of the displacement effect is the key to the success of direct job creation efforts, specific analysis of this response would be in order. One approach would be to follow that of Johnson and Tomola, and seek to evaluate the substitution patterns of employers impacted by a program. Such an approach, however, would appear to be more applicable to evaluating direct job creation via public employment, as opposed to employment subsidies to private firms. A second approach, though encumbered with serious problems of reliability, would be a direct survey of firms, in which through carefully chosen questions the extent of their knowledge regarding job creation programs, their response to the incentives of these programs, and their own appraisal of substitution responses would be ascertained. The potential biases in such survey responses are serious; however, given the importance of the issue, such an approach should be considered Again, this approach has been followed in some of the British evaluations.

The feasibility of explicit experimentation with direct job creation program alternatives should also be considered. For example, the employment response of firms to various levels of wage subsidies, to various target groups or to gross versus net marginal wage subsidies could be evaluated by

systematic variations of treatment, and with control groups. A similar kind of experimental design could be envisioned for public service employment programs. The supported work experiment for low-skill ex-addicts and ex-offenders in the United States provides an example of such an experimental evaluation.

Discerning rigid wage sectors. The analysis of this paper emphasized that a key to the ultimate effectiveness of wage subsidy programs is their ability to target job creation on sectors of the labor market with low wage sensitivity to unemployment changes. However, little is known regarding which sectors these might be or of the variance in wage flexibility among segments of the labor market. The research by Johnson and Blakemore and Baily and Tobin are initial efforts to discern the relevant sectors. Further analysis, employing more disaggregated data, would seem well worth pursuing.

Estimating the net budget cost per incremental job. Numerous claims have been made regarding the low budgetary costs of a direct job creation program because of the offsetting effects of taxes paid and transfers reduced because of the incremental earnings stemming from the program. A number of preliminary estimates of net budgetary costs have been made (including that described by Schmid [1977] and Mukherjee [1977]), but because of the ultimate dependency of these estimates on the extent of displacement, they must be viewed with scepticism. More complete analyses, which incorporate empirical estimates of the tax and transfer responsiveness and consider various displacement possibilities, would be important to the policy debate.

In performing such an analysis, the net budgetary cost of a direct job creation program must be distinguished from its gross budgetary cost. While the latter is simply the total value of the subsidies allocated directly under the program's guidelines, the former also considers the indirect effects the program may have on the levels of taxation and public expenditure.

Thus, to the extent that subsidies are allocated for workers who would otherwise be unemployed, net budgetary cost is reduced owing to: (a) tax revenue which derives from the income and spending generated by their employment, and (b) savings on unemployment benefits which would otherwise have to be paid.

Just the opposite effect is a consequence of any displacement which results from the program. If there are some workers who would have been employed in the absence of the program, but who are now unemployed, tax revenue has been lost and spending for unemployment benefits must increase.

Net budgetary cost, therefore, is calculated by adding the foregone tax revenue and additional unemployment benefits paid because of displacement to the total value of subsidies allocated. From this one would subtract the tax revenue arising from the employment of otherwise unemployed workers and the reduction of unemployment benefits as a result of their employment.[27]

Some additional topics. In addition to the topics mentioned, a number of other research efforts pertaining to direct job creation efforts would seem to be appropriate. These will be listed simply as research question:

(a) What are the costs of participating in a wage subsidy program to private firms and how can these costs be reduced so as to increase the rate of take-up?

(b) To what extent do firms in various sectors have the ability to alter production schedules in response to various employment bases in wage subsidy programs; what is the potential of such alteration in determining the employment impact of the program?

(c) To what extent are labor force participation rates likely to be especially sensitive to employment generated by direct public employment or wage subsidy programs; hence, entailing smaller reductions in unemployment than increases in employment?

(d) How are economics with substantial labor hoarding likely to respond to wage subsidy programs relative to economics with little labor hoarding, in terms of wage rate employment, and unemployment changes?

(e) What has been the attitude and response of trade-unions in Western Europe to wage subsidy and direct public employment programs?

6. CONCLUSION: WHAT DOES IT ALL ADD UP TO?

After reviewing both the theoretical and empirical analyses of the economic impacts of direct job creation programs and the numerous recent policy initiatives of this sort in Western Europe and the U.S., what can be said about them? Several conclusions seem worth mentioning.

First, direct job creation--especially wage subsidies--are being widely experimented with by most industrialized Western countries in the 1970s. While few reliable evaluations have been made of wage subsidy programs, the numerous extensions of what were to be temporary programs suggest that they have not been viewed as failures in achieving the primary objective--employment increases--set for them.

Second, this subjective appraisal is supported by theoretical and empirical analysis. This analysis suggests that marginal wage subsidy programs targetted on groups of workers with low wage elasticities (with respect to own employment levels) could have a substantial impact on the employment rates of target groups. Similar results would be expected from low wage, targetted public employment programs. In open economies, a non-negligible portion of this impact for wage subsidies is likely to be attributable to the "export subsidy" character of the program. Especially for the marginal wage subsidy programs, the budgetary cost per gross job created is likely to be relatively low.

Third, the ultimate employment effect, of course, depends on the extent of the displacement effect (defined earlier), and here the evidence is ambiguous. A tentative conclusion, but one which is likely to be widely accepted, is the following: The net jobs created by marginal, targetted wage subsidy programs and low wage public employment programs are likely to range from 20-50 percent of the gross employment effect, at least in the first few years of program operation. This percentage will vary inversely with (1) the wage flexibility of the groups affected, (2) the market competitiveness of the outputs produced by the newly employed workers, (3) the degree of substitutability of target group workers with other workers and capital, and (4) the demand reduction induced by the financing of the subsidy. For public employment programs, the displacement effect is likely to be larger the higher the wage rate paid and the less targetted is the employment on low skill workers.

Fourth, targetted marginal wage subsidies and public employment programs are likely to have a small though dampening effect on the rate of price increase. This is particularly true if the employment increases are targetted on low-wage-sensitivity labor markets. Wage subsidies, in particular, appear to rank high because of the reduction in private production costs on marginal units of output which they entail. Among the more widely discussed policy instruments for achieving increased employment, these two policies appear to have the greatest potential for "cheating the Phillips curve."

Fifth, associated with the potential of wage subsidy programs for price level reductions is their potential for favorable balance of payments effects. Even if such programs do not succeed with respect to the price level, the "export subsidy" nature of a wage subsidy program may help to reduce the balance of payments deficit (or increase the surplus).

Sixth, targetted, marginal programs are able to induce a shift in the composition of employment toward low-wage, low-skill workers, even if total displacement were to occur. Similarly, even if such programs failed to increase aggregate output, this shift in the composition of employment would lead to an increase in total employment (and, perhaps, a reduction in unemployment).

Seventh, in order to discourage rapid wage adjustments which would tend to reduce the net employment impact, wage subsidy programs should be targetted on high unemployment sectors or other sectors with substantial upward wage rigidity. For the same reasons, the wage offer in public employment programs should be pegged fairly low. Such a wage rate would

minimize upward wage pressure from such a program, and discourage increased labor force participation and employment substitution, which tends to undermine its impact on unemployment. For public service employment programs, a reasonable rule of thumb would be to set the wage rate below the prevailing wage for low skill labor and above the implicit wage rate incorporated into unemployment benefits, if such a gap exists.

Eighth, the ability of wage subsidy and direct public employment programs to meet an efficiency, benefit-cost test is problematic. The crucial variables in an evaluation of this impact are (1) the displacement effect from output competition and (2) the displacement effect from employment substitution. The first of these relates to the value and competitiveness of the output produced by the newly employed workers; the second relates to the ability of the program to target employment increments on otherwise unemployed workers. On both counts, marginal selective wage subsidies would appear to rank higher than public employment programs.

Ninth, serious design and implementation problems afflict both marginal wage subsidy and direct public employment programs. For the former, the key issues concern (1) the definition of the base from which marginal employment is to be calculated (which definition determines the magnitude of the windfall gain to employers, the job creation potency per dollar of budget cost, and the incentives of misreporting or procyclical behavior undermining the effect of the program), (2) the definition of the target groups (which definition will determine the wage response of the program, its net employment impact, and the compositional effect of the policy), and (3) the magnitude of the subsidy and the duration for which it will be in effect (which will determine employer response and the extent of pro-cyclical firm behavior). For direct

public employment programs, the key issues are (1) the definition of the target group, (2) the wage rate to be paid (which figure determines the effectiveness of the targetting of the program, the upward wage pressure which it creates, and the increase in labor force participation and employment substitution which it induces), and (3) the duration of both the program and participant eligibility (which will determine the cyclical impacts of the program and worker job search behavior).

Finally, little research and evaluation of the employment, displacement, wage increase, balance of payments and efficiency impact of direct job creation measures has, until now, been undertaken. Although the research problems are difficult ones, much can be learned from explicit evaluation studies ranging from carefully designed experiments through expost benefit-cost evaluations through improved cross-section estimates of crucial behavioral responses through country-oriented simulation-sensitivity analyses to straightforward survey evidence on employer and worker responses to such programs.

What, then, does it all add up to? Considering all of the theoretical and empirical results, a conclusion something like the following would appear defensible: Marginal, targetted wage subsidy programs with a base designed to minimize adverse employer responses (e.g., 102 percent of a moving average of monthly employment taken over the past 18 months) would appear to be among the most potent instruments for creating employment (with minimal adverse side effects in the form of increased wages and prices or balance of payments problems) and altering the composition of employment toward those with low skills and high unemployment rates. Targetted, low

wage public service employment programs would also appear to have employment creating potential, but confront the difficult efficiency problem of insuring the production of highly valued output. With continued high unemployment concentrated in particular regions and categories of workers, substantial experimentation with these approaches--and evaluation of the experiments--would be in order.

Appendix A

Table A-1 presents a tabular summary of the primary employment subsidy programs in Western Europe and the U.S. in the mid-1970s. It relates the size of these programs to the labor force and number of unemployed workers in the relevant countries, and presents a rough estimate of the budget cost per subsided job.

The information contained in columns 1-5 is firm; it relies on documents released by the countries or data included in OECD documents. The numbers in column 6 (gross number of subsidized workers) are generally accurate, but difficult to interpret. This is so because estimates for some of the countries refer to the number of jobs (or workers) affected during a year, many of which may be for less than one year, while estimates for other countries refer to the stock of jobs being subsidized at some point during the year. Moreover, all of these numbers refer to the gross jobs affected, and not the relevant net employment effect. For this reason, the numbers in columns 7 and 8 must be interpreted with caution. The subsidized jobs as a percentage of unemployed, for example, may be the quotient of a gross figure for an entire year and a yearly average. The numbers in column 9 (annual budget cost) are even weaker than the gross jobs data. In most cases the data were obtained from country reports; in some cases, however, the numbers were calculated from data on the average subsidy payment and the gross number of workers affected. Moreover, in some cases the budget estimates include expenses for some non-subsidy costs (e.g., training), whereas in others do not. For this reason, the data in columns 10-11 are very crude, and must be so regarded.

From this comparison it appears that the United Kingdom and Sweden have implemented the most extensive employment subsidization schemes in terms of

both total budget costs and number of jobs affected. In the case of the U.K., however, this is tempered by the fact that the Regional Employment Premium is a general (i.e., nonmarginal) premium and hence covers many more jobs than the number which it generates; it is the only nonmarginal, nontargetted policy in effect.

In terms of the size of the subsidy paid (as a percentage of the wage), programs in West Germany and Sweden are the most generous, with subsidies extending up to 60-70 percent. The 50 percent figure for the U.S. New Jobs Tax Credit is relatively high, but the $2100 per job cap constrains the actual average subsidy payment. This is reflected in the data on the average budget cost per job affected. Only the West German Wage Cost Subsidy and the Swedish Employment Maintenance Training Subsidy programs have per job budget costs in excess of $2500. The United Kingdom Temporary Employment Subsidy and the U.S. New Jobs Tax Credit have per job subsidy costs in the $1500-$2000 range.

Table A-1

Employment Subsidies in the U.S. and Western Europe in the 1970s

(1) Country	(2) Program	(3) Type	(4) Duration	(5) Extent of Wages Subsidized	(6) Gross Number of Subsidized Workers	(7) Gross Subsidized Workers as % of Labor Force	(8) Gross Subsidized Workers as % of Unemployed	(9) Annual Budget Cost	(10) Budget Cost Per (Gross) Jobs Subsidized	(11) Budget Cost as % of Government Budget
U.S.	Earned Income Tax Credit	Welfare, LS	permanent	10% up to $4,000; phased out at 10% rate up to $8,000	7.5 million	1976: ~8%	(1976: >100%)	1976: ~$1.1 billion	$147	~.3
U.S.	New Jobs Tax Credit	M,N,G	temporary	50% of the first $4,200 paid to each marginal worker	≈400,000-700,000	1977: ~.4-.7%	1977: ~7-11%	1977: ~$1.5 billion	$1,500-$2,000	≈.4%
W. Germany	Wage Cost Subsidy	M,R,T	temporary	60%	73,900	1975: ~.3%	1975: ~7.3%	1975: ~$191.2 million	≈$2,423	~.1%
W. Germany	Mobility Subsidy	LS,R,T	temporary	~$200 for married workers	56,400	1975: ~.2%	1975: ~5.6%	1975: ~$12.9 million	≈$ 229	(insignificant)
France	Incentive Bonus for Job Creation	M,N,T	temporary-extended	≈$30 per week per marginal worker for 6 months	Overall (3/77): 88,508; 1976: 38,320	1976: ~.2%	1976: ~4.3%	1976: ≈$30 million	≈$ 750	≈.5%
France	Employment and Training Contracts	LS,M,T	temporary-extended	30% of minimum wage for 6 months, 100% for 1-2 months of training offered; training subsidized at $1.50 per hour per trainee	April-December 1976: 11,394; Overall (3/77): 27,000	1976: > .1%	1976: ~1.5-2.0%	1976: ~ $15 million	~$1,000	≈.25%
France	Youth Payroll Tax Exemption	N,T	uncertain	exemption from social security contributions for workers under 25	1977: ≈340,000	1977: ~35%	1977: ~1.5%	NA	NA	NA
Netherlands	30 Percent of Wage Costs Scheme	M,N,T	temporary-extended	30%	1977: 4,000	~.1	1976: ≈2.0%	1976: ~$10 million	≈ $2,500	~.03%
Netherlands	Regional Investment Premium Scheme	M,R,G	temporary-extended	$1,500 per year per marginal worker	Overall (2/77): 2,961	> .1	1976: ≈1.4%	NA	NA	NA
Sweden	Employment Maintenance Training Subsidy	LS,M,N,T	ongoing	Prior to 1977: 22-33% for 6 months, 1977 on: 65% for 1st month, 40% next 5 months	1976: 13,000. Since: 40-50,000 per month	1976: ≈ .3% 1977: > 1%	1976: ≈68%	1977: ~$254.8 million	≈$4,044	~1.1%
Sweden	Regional Employment Growth Subsidy	M,R,G	permanent	11% for 2 years; 5½% for 3rd year	≈1,500 additional jobs per year	(insignificant)	1976: ~2%	1977: about $5.6 million	~$3,733	(insignificant)
Sweden	Youth Employment Subsidy	M,N,T	temporary-extended	25%	≈4,000 per month	1976: ~.2%	1976: ~6%	NA	NA	NA
Sweden	Disabled, Elderly, and Specialized Workers Wage Subsidy	LS,N,T	permanent	40% for workers 50 years or older or handicapped; 75% for firms "threatened" by low demand	1977: 15,000 handicapped. Estimate for elderly, others ≈30-35,000	1977: ~1.1%	1976: ~65%	1977: $74 million	~$1,700	≈.2%
Sweden	Temporary Wage Subsidy	M,N,G	temporary	July-Sept. 1978; $2500/marginal worker	NA	NA	NA	NA	NA	NA
Ireland	Premium Employment Program	M,R,T	temporary-extended	~25%	1976: 7,000	1976: ~.6%	1976: ~7%	1976: ~ $2 million	~$ 350	>.6%
United Kingdom	Regional Employment Premium	R,G	permanent (terminated, 1977)	Prior to 1974: about 3%; 1974 on: 5-7%	1975: about 1,500,000	1975: ~5.8%	1975: >170%	1975: ~ $500 million	~$ 330	>.6%
United Kingdom	Temporary Employment Subsidy	M,N,G	temporary-extended	~$40 per week (≈30-40% of average wage)	1977: about 185,000	1977: ~.9%	1977: ≈20%	1977: ≈$350 million	~$1,900	≈.4%
United Kingdom	Small Firms Employment Subsidy	M,N,R,T	temporary-extended	≈$40/wk/marginal worker for 26 weeks	7/77-4/78: 8,250	insignificant	≈.5%	7/77-4/78: ≈$9 million	≈$1090	Insignificant

Sources: Labour force and employment figures from OECD: Labour Force Statistics; budgets of countries obtained from U.N. Statistical Yearbooks.
Other information from OECD documents and country surveys.

LS - designed to augment labor supply or upgrade worker skills
M - marginal
N - national
R - regional
G - general (applying to all workers)
T - targetted (applying only to certain groups)

NOTES

[1]For a discussion of the efficiency impacts of targetting public works activities in the U.S. Great Depression, see Kesselman (1978).

[2]See Haveman (1973), for a discussion of the nature and impacts of earnings supplements.

[3]See Barth (1972) for a discussion of the nature and impacts of wage rate subsidies.

[4]It should be noted that earnings supplements which seek to restrict benefits to low earnings recipients tend to have a marginal tax rate after some earnings level. This marginal tax rate tends to induce reductions in labor supply for those who are subject to it.

[5]Information for this section was obtained from information supplied by university and government officials in the various countries and from the Organization for Economic Cooperation and Development. Also helpful were National Commission for Manpower Policy (1975); National Commission for Manpower Policy (1976); and Gosta Rehn (1978).

[6]Appendix A presents a table summarizing the major wage subsidy programs, their size, and gross employment effects.

[7]For a more complete discussion of the New Jobs Tax Credit and an analysis of its impacts, see Ashenfelter (1978) and Bishop and Lerman (1977).

[8]See Schmid (1977) for a more complete analysis of this program.

[9]In the early phase of the program the numbers were set at 50 or more workers, subsidization at about $20 per week, and extensions making subsidization possible up to 6 months. Also, the program was formerly targetted at depression regions.

[10]It should be noted that the German schemes described above did have a regional dimension as well.

[11]A 1975 evaluation indicated that the "support areas" experienced employment growth of 10 percent per year from 1971-74, while the remainder of the country experienced 5 percent growth. This difference was largely attributed to this regional policy. The regional subsidy program contains (in addition to the employment subsidy) a loan and grant program for plant construction and equipment, "introduction" and training subsidies for newly hired workers, and temporary public workers. Gosta Rehn (1978) reports that from 1970-1975, the target region grew in industrial employment by 30 percent, while the rest of the nation grew by 1 percent.

[12]The creation of jobs by means of public initiatives is difficult to categorize, as the subsidies vary extensively by target group, duration, firm vs. individual subsidy recipient, and so on. Sweden, for example, seeks employment stabilization via the creation of investment reserves from private profits sheltered from taxation and releasable at government discretion and the direct subsidies for stockpiling of inventories up to 20 percent of market value of goods produced, in addition to the policies discussed. It was estimated that, in the relatively slack year of 1972, over 4 percent of Sweden's labor force was kept employed by these two policies, plus temporary public works, sheltered and semi-sheltered public employment, and labor market training programs.

[13]Because public employment programs do not have the price reduction potential that wage subsidies do, this discussion will be limited to the impacts of the latter policy.

[14]Recent experience with public employment programs does not suggest that they have been particularly effective in targetting employment demands on disadvantaged workers. These programs, however, did not have such targetting as their primary objective.

[15]Johnson and Tomola (1977) report that for public employment programs in which 45 percent of the jobs provided represent net job creation, the per job cost is $14,500.

[16]Although such a simulation has not been undertaken, a macro-data model exists which could trace some of these sectoral responses. See Golladay and Haveman. The difficulty for such models to incorporate the relevant substitution responses on both the supply and demand sides of the labor market should be noted, however.

[17]Kesselman's study (1978) of public employment in the Great Depression does attempt to capture these 2nd, 3rd, and nth round impacts. Although his discussion is largely qualitative, the analytic framework which he employs is a more comprehensive one than the partial analyses described here.

[18]In the primary simulation, Johnson assumes that (1) 30 percent of the labor force is unskilled, (2) the unemployment rate for unskilled labor is 20 percent, (3) unskilled jobs have a wage rate of $3.00 per hour, and (4) the elasticity of substitution is 1.25. In the short run, he concludes

that a $1 billion wage subsidy for unskilled labor will increase their employment by 208,000. If wages adjust quickly (slope of the unskilled Phillips curve equal .7) the employment effect disappears after 5 years. Slow adjustment of the low skill wage rate (slope of the unskilled Phillips curve equal .1) causes the employment impact to disappear slowly so that its effect after 15 years is one-sixth of its first year effect. For most of the cases simulated, the effect of the subsidy was to ultimately reduce aggregate employment and output. This occurred especially if the replacement rate is high (implying a negative effect of unemployment benefits on labor supply), the elasticity of relative labor supply is high, and the elasticity of substitution is high. In all cases except that in which there is no long run adjustment of the low skilled wage rate, total employment and income are adversely affected in the long run.

[19]There was an earlier Johnson and Tomola study on the PEP program which employed a similar methodology and which estimated the one-year fiscal substitution effect to be .6. (See G. Johnson and J. Tomola: "The Efficacy of Public Service Employment," Technical Analysis Paper 17A, U.S. Department of Labor, Office of the Assistant Secretary for Policy, Evaluation, and Research, 1975, processed.) This study was critiqued by Wiseman (1976) who argued the the displacement estimate was unreliable because the analysis (1) ignored the coincidence of PEP with spiraling wage costs, (2) by lagging the effect of income, may have interpreted a recession-induced drag in hiring as displacement, (3) assumed subsidies to be identical to other forms of income when, in fact, they may evoke different responses from politically sensitive decision-makers, (4) did not consider that PEP was consciously employed for

funding summer jobs for youths previously funded by other programs, thus biasing displacement estimates, and (5) did not disaggregate workers by job type or employer type (Johnson and Tomola used a rough average of the number of PEP recipients engaged in educational capacities when there may have been important variations in this figure over time). In general, Wiseman notes that displacements calculations are very sensitive to functional form and time periods considered. One additional study of displacement in the PEP program should also be mentioned. It was undertaken by the National Planning Association, and used cross-sectional data on demonstration areas with exceptionally high allocations of public services jobs. By comparing employment patterns in these areas with matched areas without substantial public service jobs, the study found the 1-year fiscal substitution effect to be .46. In critiquing this study, Wiseman found that it: (1) miscalculated the fiscal substitution effect, (2) made no adjustments for implementation patterns, and (3) actually had jobholders in its control group who were recipients of PEP funds. His calculations adjust the NPA figure to .39.

Borus and Hamermesh (1978) have critiqued a version of the Johnson and Tomola study which was revised in response to criticisms such as Wiseman's. They conclude that the later version represents a significant improvement over earlier work. They nevertheless hold serious reservations about the authors' findings.

First, although Johnson and Tomola suggest that, after six quarters, there is essentially zero net public sector job creation per 100 PSE jobs, one can only be 95 percent confident that this number is between 110 net jobs created and 114 net jobs lost. Johnson and Tomola admit to this uncertainty, and Borus and Hamermesh feel this should be emphasized.

Other criticisms involve what Borus and Hamermesh feel to be the restrictive nature of the authors' Almon lag procedure, and the fixed relationships one finds among the variables in the authors' model. For example, there is no allowance made for the relationship between employment and per capita income. It is possible that the pessimism engendered by the authors' study is in part the spurious result of the simultaneous occurrence of public employment program growth with taxpayer revolts at the local level. These and other political developments have produced a decrease in the percentage of income designated for state and local employment.

Finally, it should be noted that some CETA job slots have been sub-contracted to non-profit institutions. In the view of Borus and Hamermesh, these slots would not affect government employment unless these institutions performed services in lieu of government units. Borus and Hamermesh feel that this is unlikely, and point out that Johnson and Tomola subtracted these slots from total state and local government employment to compute the fiscal substitution effect.

[20]Government output depends upon both public employment and nonlabor inputs.

[21]This stickiness is viewed as stemming from institutionally imposed rigidities, such as minimum wage legislation, which creates excess supplies of low skill labor at going market prices.

[22]Thirty-six demographic (age-sex-race) labor force groups were distinguished in this analysis.

[23]The adjustment recognizes that labor force growth may depend upon employment opportunities (unemployment rates). Johnson and Blakemore assume three values of the relationship of labor force growth and unemployment to test their results, concluding that in all cases only black youths suffer from structural unemployment.

[24]Summaries of these studies are reported in various issues of the Department of Employment Gazette.

[25]Indeed, it would have been desirable to have incorporated an evaluation research component into the program when initiated.

[26]Indeed, if the employment growth in both target and non-target regions is expected to be the same without the program, a comparison of employment patterns over time between the two regions would be a test of program impact.

[27]Early estimates by Mukherjee (1977) indicated a very low, if not negative, value for wage subsidy programs. He implicitly assumed, however, that this could be computed by subtracting the tax revenue arising from the employment of covered workers and the value of unemployment benefits it is assumed would have been necessary in the absence of the program from the value of the subsidies granted. This calculation ignores displacement effects.

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